JOURNAL
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AMERICAN VETERINARY MEDICAL ASSOCIATION

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Volume CXIX OCTOBER 1951 Number 895

Porcine **Immunization**

Cholera

III. Lifetime Immunity the Basis of Racial Survival

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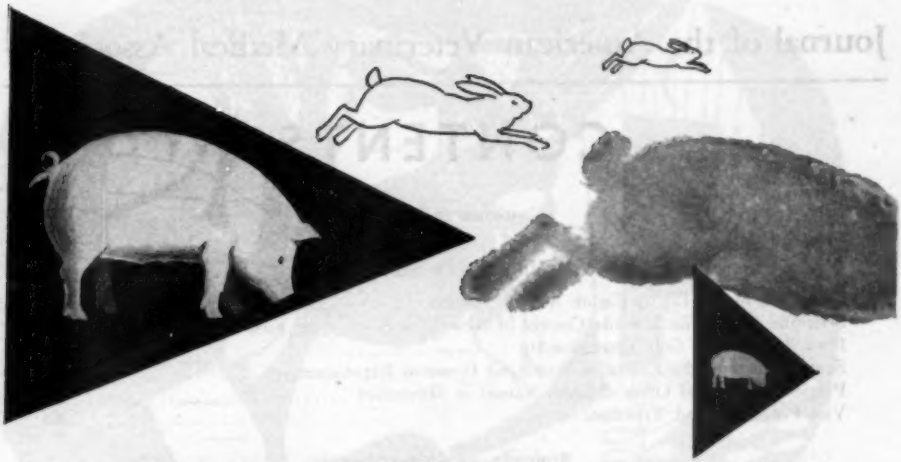

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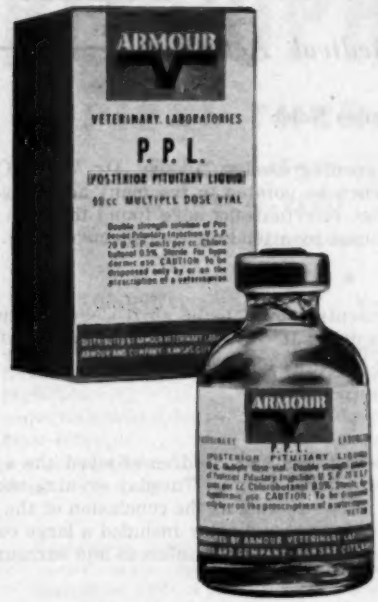

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AVMA ☆ Report

Veterinary Medical Activities

Convention Notes

◆ In his presidential address at the opening session Monday, Dr. W. M. Coffee keynoted the success of the meeting when he pointed to the many advantages of AVMA membership and to the fact that veterinarians have found they can combine a vacation with a postgraduate course by attending annual conventions.

★ ★ ★

◆ The Committee on Local Arrangements proved to be shirt-sleeve executives who know how to do the job as well as direct it. They made important decisions with efficiency while pitching in to do anything and everything that needed to be done.

★ ★ ★

◆ Nearly 1,500 veterinarians and their wives and children enjoyed the special night for veterinarians at the Wisconsin State Fair on Tuesday evening, August 21. Announcement was made of their presence and, at the conclusion of the show on the stage before the grandstand, the fireworks display included a large colored reproduction of the well-known AVMA emblem, the "V" caduceus and surrounding borders.

★ ★ ★

◆ By action of the Board of Governors and the Executive Board of the AVMA, Executive Secretary John G. Hardenbergh was delegated to represent the Association at the First Pan American Congress on Veterinary Medicine, to be held at Lima, Peru, on Oct. 20-26, 1951.

★ ★ ★

◆ A photographer from *Life* magazine took 200 pictures of the television demonstrations.

★ ★ ★

◆ Eleven of the eighteen living past presidents of the Association were at Milwaukee: Drs. L. A. Merillat, T. A. Sigler, T. H. Ferguson, R. S. Mackellar, Sr., H. D. Bergman, C. W. Bower, James Farquharson, B. T. Simms, W. A. Hagan, L. M. Hurt, and C. P. Zepp, Sr. A picture of nine of those present was taken and will appear in the November JOURNAL.

★ ★ ★

◆ Although this issue contains many highlights of the 88th Annual Meeting, members are reminded that there will be a "Proceedings Book," which will contain a complete and detailed account of all that transpired, including manuscripts, committee reports, minutes of the House of Representatives, reports of related group conferences, and so on. The "Proceedings Book" of the 1951 meeting will be mailed again to all members without charge, as was the 1950 edition.

★ ★ ★

◆ The luggage, presented by the Veterinary Exhibitors' Association, was won by Dr. F. A. Hall, extension veterinarian at Purdue University, West Lafayette, Ind. The awarding of this prize took place on Wednesday evening at the president's reception.

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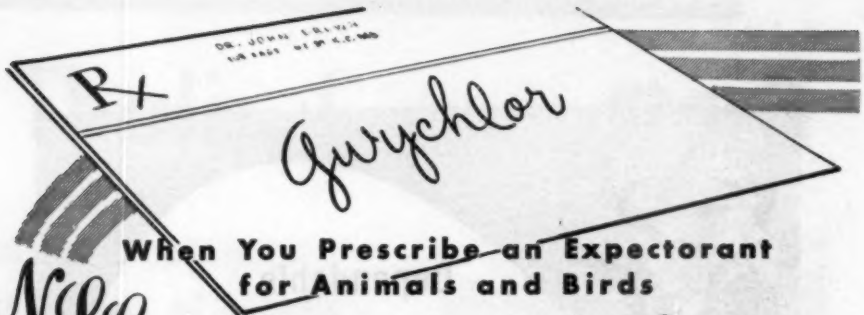

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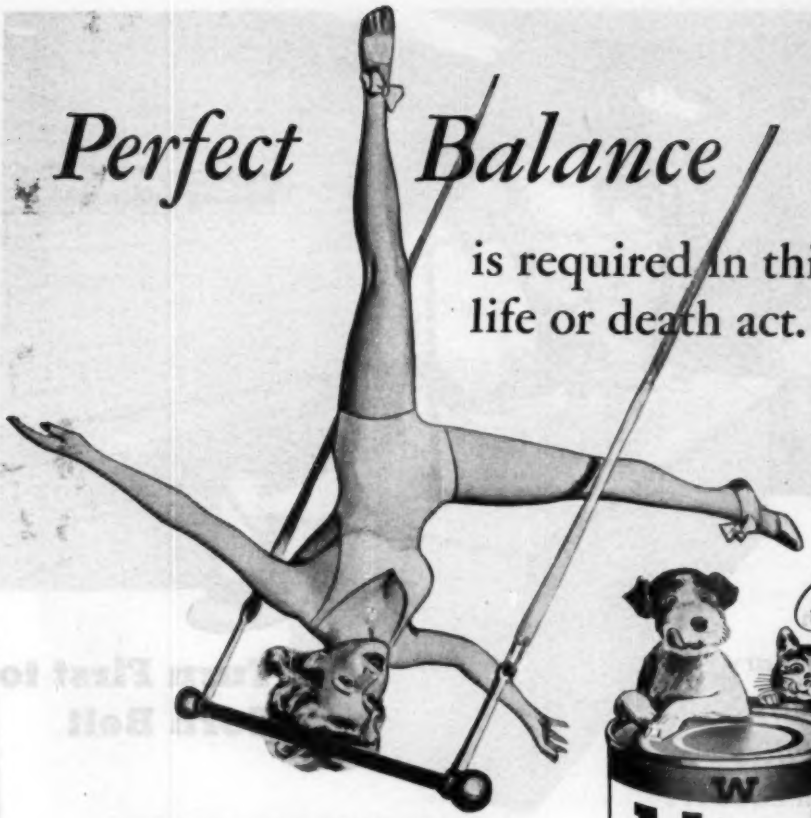

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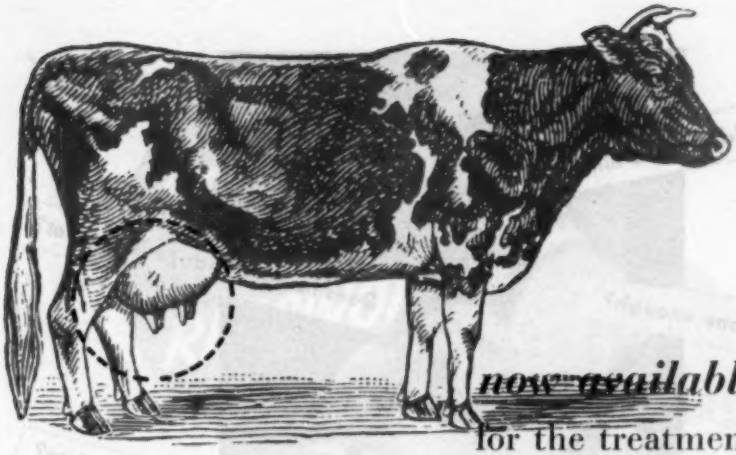

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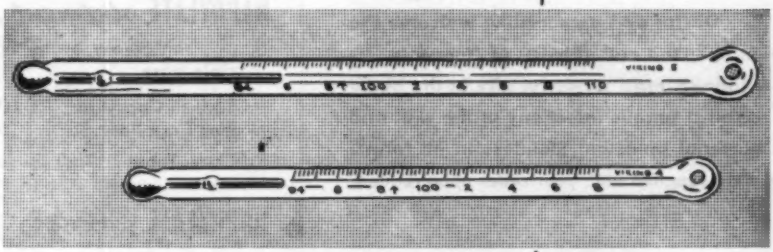

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A Vital Natural Factor in Animal Nutrition

In making vitamin-enzyme concentrates available to the veterinarian, the Rumelk Company offers the profession a highly effective method of treating nutritional deficiencies and functional digestive disorders with Natural Factors.

Enzyme cultures used in our concentrates are prepared by an exclusive process, which produces a new and more practical combination of enzyme systems that have a maximum potency in the growth media.

B Complex Vitamins, for example, are present in quantity as Natural Factors in the enzyme growth. B_{12} is also an inherent factor grown in the media by enzyme culture.

Digestive malfunction in animals is a contributing cause of various deficiencies, and this condition is usually the outcome of poor diet and inactivity. Concentrated vitamin-enzyme supplements, as prepared by the Rumelk Company, give the veterinary profession the positive means of treating animals with the Natural Factors which nature intended for the animal to receive in order to maintain proper digestion for efficient food assimilation.

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The Rumelk Company offers the profession the following vitamin-enzyme products for nutritional therapy:

RU-ZYME* (cow) for mature ruminants
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*Contains preserved rumen bacteria (U. S. Patents Pending)

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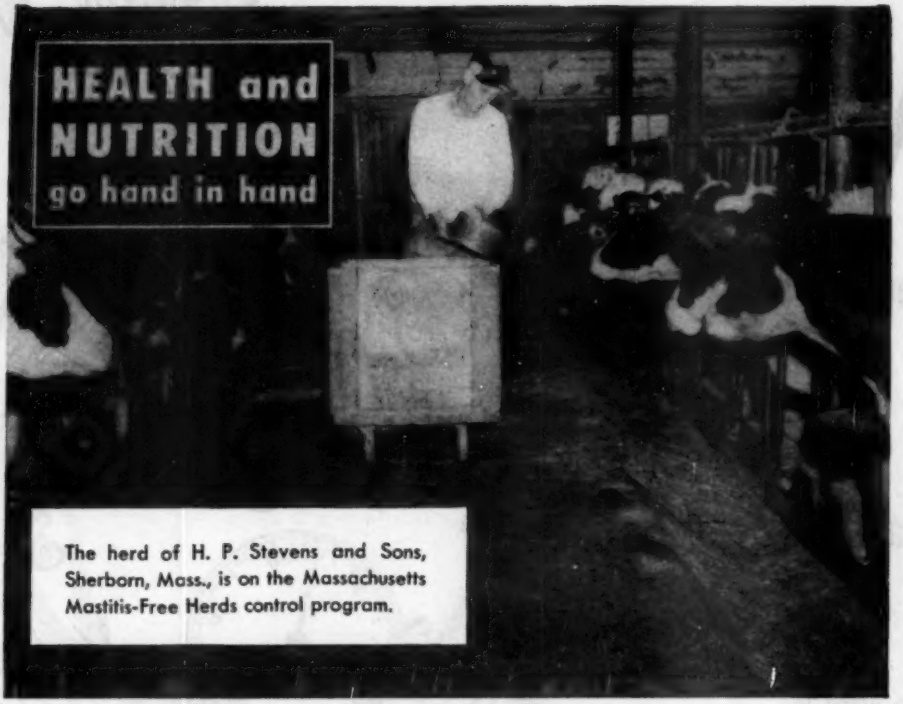

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Operation	No. of dogs	Average age in years	Weight in lbs.	Dosage	Results
Phlebotomy	12	8	20-30	2 cc. im. preoperatively; 2 cc. in 200 cc. 5% glucose and saline solution postoperatively	Fair
Enucleation of eye	9	6	10	1 cc. im. preoperatively; 2 cc. in 200 cc. 5% glucose and saline solution postoperatively	Good
Mammary tumors	26	11	35	Same	Excellent
Amputation	14	10	14	1 cc. im. preoperatively	Excellent
Cesarean section	9	6	13	2 cc. im. preoperatively; 2 cc. in 200 cc. 5% glucose and saline solution postoperatively	Good
Miscellaneous abdominal (torn spleen, small tumors, hunting injuries, hernia, intestinal resections, cancer of bladder)	40	all ages	all wgts.	2 cc. im. on admission; 1 cc. iv. if indicated	Good

im.—intramuscularly iv.—intravenously

That Koagamin offers a wide margin of safety is apparent in the author's results, and in his statement that no untoward effects or incompatibilities were noted in the series.

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[1]Klausman, B.S.: *The Use of a New Chemotherapeutic Agent to Arrest Bleeding in Animals*, Vet. Med., XLVI:282 (July) 1951.

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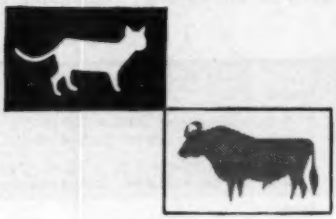

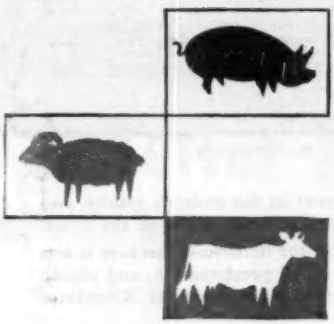

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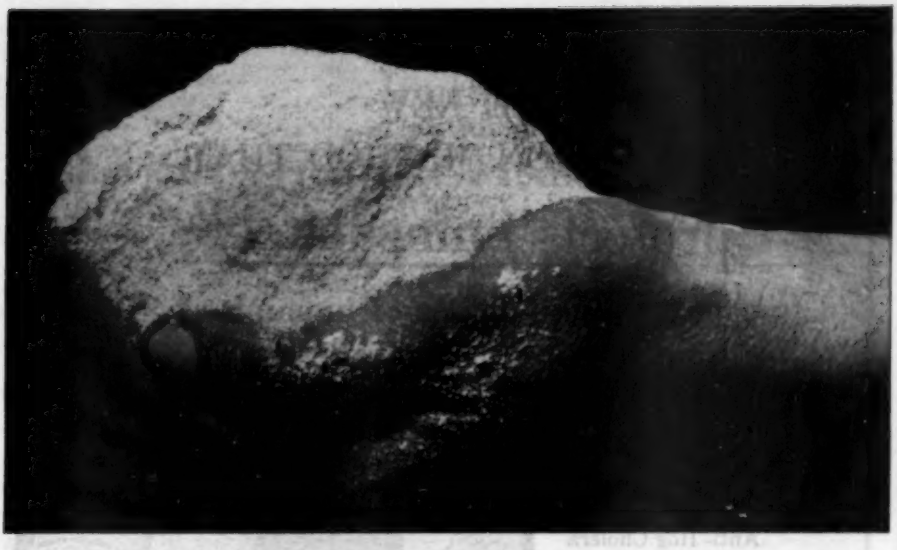

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VOL. CXIX OCTOBER, 1951 NO. 895

Highlights of the Eighty-Eighth Annual Meeting
Milwaukee, Aug. 20-23, 1951

The Milwaukee session exceeded all expectations and forecasts of its being the biggest and best AVMA convention ever held. The general excellence of the program plus special features of it, such as the discussion of new hog cholera vaccines and the television clinics, and the central location of the convention city, all were factors in attracting a record-breaking attendance.

Official Attendance Figures

The breakdown of registration is as follows:

Veterinarians — members	1,597
Veterinarians — nonmembers	90
(Total veterinarians 1,687)	
Women (951) and children (57)	1,008
Exhibitors (other than veterinarians)	210
Guests	155
Students	68
Total	3,128

The previous high mark of 2,226, set at Cincinnati in 1947, was broken on the first actual day of the convention with 1,087 early registrants on Sunday and 1,297 more on Monday, a total of 2,384. Had an unknown number of members been able to obtain hotel accommodations at the last minute, the total might well have been 3,500 since it is known that many stayed at home when advised that no more rooms were available.

Although the hotel situation became very tight several weeks before the meeting dates, it should be said that the convention bureau and Milwaukee hotels made good the promises originally made for housing AVMA registrants and then exceeded their quotas of rooms considerably as the demand developed. As usual, the greatest difficulty was experienced with those who made late requests or who came to Milwaukee without reservations.

Geographic Distribution

Veterinarians and members of their families were present from every state in the Union (an unusual record in itself) and from Canada, Alaska, and Mexico, so that every segment of North America was represented. In addition, Cuba sent 11 delegates, the Philippine Islands 1, and other foreign countries 19, as shown in the table.

The five states with the greatest representation were Wisconsin (606), Illinois (433), Iowa (217), Michigan (213), and Indiana (180).

In the House of Representatives, delegates of 53 of the 61 constituent associations answered the roll call at the sessions on August 18 and two delegates arrived too late for the House meeting.

The complete geographic distribution of registrants follows:

Alabama	25	Kentucky	20
Arizona	2	Louisiana	13
Arkansas	7	Maine	9
California	47	Maryland	25
Colorado	20	Massachusetts	19
Connecticut	15	Michigan	213
Delaware	6	Minnesota	160
District of Columbia	34	Mississippi	18
Florida	31	Missouri	120
Georgia	41	Montana	7
Idaho	4	Nebraska	39
Illinois	433	Nevada	2
Indiana	180	New Hampshire	2
Iowa	217	New Jersey	18
Kansas	76	New Mexico	5
		New York	118

North Carolina	15
North Dakota	20
Ohio	165
Oklahoma	33
Oregon	10
Pennsylvania	65
Rhode Island	3
South Carolina	7
South Dakota	36
Tennessee	30
Texas	57
Utah	11
Vermont	6
Virginia	21
Washington	13
West Virginia	10
Wisconsin	606
Wyoming	4
Subtotal (U.S.)	3,038

Alaska	1
Canada	57
Cuba	11
Mexico	1
Philippine Islands	1
Australia	1
British West Indies	1
Denmark	2
England	1
Germany	2
India	1
Israel	1
Italy	1
Netherlands	7
Norway	1
Puerto Rico	1
Total	3,128

EXCERPTS FROM REPORTS OF OFFICERS

Executive Secretary J. G. Hardenbergh reported that 1,077 applicants were admitted during the year with a net gain in membership of 837 after deducting losses for various reasons. Although there was a small operating deficit for the year, capital investments in new equipment and furniture were in excess of the deficit. The costs of new activities undertaken by the Association in the past five years have increased from a total of about $7,000 in 1946 to over $26,000 in 1951. These new activities include such added member services as the motion picture library, professional relations work, the resumption of publishing the annual "Proceedings" in one separate volume, the construction of scientific exhibits depicting important phases of veterinary science, and the payment of one-half of the travel expenses of delegates to the annual meeting of the AVMA House of Representatives.

Treasurer W. A. Young reported total receipts of $212,754.46 for the fiscal year and total disbursements of $214,016.32, with an operating deficit of $1,261.86, the smallest in five years.

Mrs. Helen Bayless, assistant editor and advertising manager, reported the monthly JOURNAL had published a total of 161 manuscripts, including 49 case reports, a total of 926 pages of reader material. The JOURNAL had 72 regular advertisers during

The Opening Session

The Opening Session of the Eighty-Eighth Annual Meeting in Milwaukee, August 20, 1951. Dr. J. T. Schwab is shown responding to the welcoming address of the president of the Common Council of Milwaukee.

the year. In the past eleven years, the publication has had nearly a four-fold increase in advertising revenues. The quarterly *American Journal of Veterinary Research* carried 68 original articles with a total of 344 pages of reader and 16 pages of advertising.

In his report as director of Professional Relations, Dr. C. D. Van Houweling reported on the work of the Emergency Advisory Committee on military service and procurement aspects affecting veterinarians, civil defense planning, and the correlation of these with state associations. He also reported the increased availability and use of visual aids such as the 2 x 2 slides on selected subjects; the AVMA film library now comprising 27 16-mm. films and the cataloging of 39 other films of veterinary interest. Other special activities undertaken in Dr. Van Houweling's dual capacity of assistant executive secretary and professional relations director included work with the Scientific Exhibits Committee, the Veterinary Service Committee, and all the standing and special committees and representatives of the Association, particularly the Committee on Program for this meeting. A number of legislative matters also required considerable attention during the year and emphasized the need for some kind of representation in Washington.

In reporting on public relations work conducted by the central office, Mr. J. J. Shaffer noted the increasing requests for assistance on varied subjects from members, other associations, and by writers for lay periodicals. He stressed the need for increased attention to ethical matters by state and local associations, some arrangement for hearing and settling "grievances" between clients and veterinarians, and the desirability of a telephone listing for local or state associations especially in metropolitan areas.

Dr. K. G. Nicholson, chairman of the Committee on Local Arrangements for the Milwaukee meeting, making announcements at the Opening Session.

Meetings of Association Secretaries, Editors, and Public Relations Workers

On Sunday, August 19, an all-day session of constituent association secretaries, editors and public relations workers was held. The morning was devoted to a joint discussion led by Dr. E. E. Jones of the California V.M.A. and Dr. S. D. Merrill of the

Buffet Supper for Student Chapters and Auxiliaries

The buffet supper, at which the student chapters and auxiliaries were guests of the AVMA, was a friendly, get-acquainted affair on Sunday night, August 19.

Maine V.M.A. on the subject of "Doing a Three-in-One Job." Dr. A. H. Quin, chairman of the AVMA Public Relations Committee, and Mr. J. J. Shaffer also discussed public relations work. Dr. R. E. Ruggles, president, American Animal Hospital Association, was moderator of the public relations panel.

At a luncheon session following the morning meeting, Dr. R. L. Anderes, editor of *Veterinary Medicine*, presided and introduced Mr. W. D. Knox, editor of *Hoard's Dairyman*, who spoke on "An Agricultural Editor Looks at Veterinarians." In a frank and conscientious appraisal of veterinarians, Mr. Knox pointed out several ways in which the veterinarian could better serve his clients. His address will be published in the 1951 "Proceedings Book", as will more complete reports of the other conferences held during the day for separate groups of association secretaries, editors, and public relations workers.

STUDENT CHAPTER BUFFET SUPPER

On Sunday evening, August 19, representatives of student chapters and their wives, AVMA and Auxiliary officers and their wives or husbands and guests, to the number of about 100 in all, gathered for a buffet supper as guests of the Association. Afterward, a business meeting of student chapter delegates was held.

• • •

President John R. Wells, Dr. Walter R. Krill, and Dr. M. R. Clarkson took part in the coast-to-coast broadcast on Saturday, August 25, on the National Farm and Home Hour, Station WTMJ in Milwaukee. Highlights of the convention and biological warfare were discussed. Paul Visser, agricultural director of the National Broadcasting Company, made a special trip to Milwaukee to announce the AVMA section of the program. The sponsor of the National Farm and Home Hour is the Allis-Chalmers Manufacturing Company, the executives of which were on hand to hear the broadcast.

• • •

In order that the small, specialized groups that meet under AVMA sponsorship at convention time may express their ideas on subjects discussed to the governing bodies of the AVMA, a motion, made by Dr. E. C. Chamberlayne of Canada at the AVMA Conference of Public Relations Workers and unanimously passed by the Conference, recommended that resolutions be drawn and passed at the close of such conferences on matters de-

President's Reception

A small portion of the receiving line at the President's Reception. President Coffee is shown (white coat and black tie) greeting guests. Mrs. Dennis Coughlin (left), president of the Women's Auxiliary, is also greeting guests in the receiving line.

serving attention, the resolutions to be filed with the Association.

• • •

Committees Urged to Start Work Immediately.—In making committee appointments for the coming year, President John R. Wells pointed out in his letters, sent well in advance of the annual convention, that he hoped it would be possible for some of the committees to meet and begin planning their year's work during the convention in Milwaukee. Many of the committees, or at least members of certain committees, met and discussed plans and activities for the coming year.

It is certainly necessary for the committees to begin their programs immediately, as the interconvention year will be only ten months in length, the 1952 convention dates being June 23-26 in Atlantic City.

• • •

Dr. John R. Wells, who presided at the House meeting as president-elect and is now AVMA president, stressed the following points in his address to the House: (1) that approximately one-third of the veterinarians in the United States are not AVMA members; (2) that a grass roots campaign to enroll these members is needed; (3) that the campaign has been carried on in the past through the mail and has not been effective; (4) that it would take personal contact to enroll these men as members; and (5) that he pledged himself to organize a membership campaign on a personal contact basis and to enlist the help of AVMA representatives in the various states.

• • •

1951 Award Winners.—Dr. R. S. Sugg, Auburn, Ala., received the Twelfth International Veterinary Congress Prize for "outstanding service by a member of the AVMA to veterinary medical science and the profession" for many accomplishments, especially his leadership in behalf of the regional veterinary education plan in the southern states.

Dr. A. H. Quin, Kansas City, Mo., received the AVMA Award "for meritorious service to the membership" for his many years of devoted service to the veterinary profession, especially his leadership in public relations work.

Dr. L. A. Klein, Moylan, Pa., received the Borden Award and medal "for outstanding research contributing to dairy cattle disease control", especially his researches on mastitis.

Distinguished Foreign Guests.—Among visitors from abroad were Dr. Kurt Wagener, professor of Veterinary Microbiology and Hygiene, Veterinary College, Hanover, Germany; Dr. Jacob Jansen, professor of Infectious Diseases, and Dr. Walter Johan Roepke, head of the Poultry Health Service, Veterinary College, Utrecht; Dr. Jan Willem Thijn and Dr. Jaques M. van den Born, director and inspector, respectively, in the Animal Health Service of the Netherlands; Dr. Okkf Bosgra and Dr. Frans H. von Raadshoven, of the Government Serum Institute and University of Utrecht, respectively, and Dr. Jan Ido Torpstra, also of the Serum Institute; and Dr. Gunter Heinze, public health veterinarian of Berlin, Germany.

• • •

Among proposals considered by the Women's Auxiliary was the opportunity to assist the Research Fund-Raising Committee in obtaining contributions to finance AVMA research fellowships. The proposal will be voted on at their meeting during the AVMA convention in Atlantic City.

Scientific Exhibit on Mastitis Control in New York State Wins First Place

Of the dozen educational exhibits displayed at the Eighty-Eighth Annual Convention in Milwaukee, an exhibit on mastitis control in New York State was awarded first place by the judges. Prepared by Drs. James M. Murphy and Harry T.

Conference of Secretaries, Editors, and Public Relations Workers

The speakers' table at the AVMA luncheon for those attending the Conference for Secretaries, Editors, and Public Relations Workers on Sunday, August 19. Mr. Knox (center, leaning forward), editor of Hoard's Dairyman, was the speaker at the luncheon.

Hodges of the New York State Mastitis Research Control Program, it depicted how New York veterinarians are dealing with bovine mastitis.

The committee of judges awarded second place to the exhibit on radiological aspects of abnormalities in domestic animals, which was prepared by Dr. Francis A. Spurrell of the School of Veterinary Medicine, University of Minnesota.

Third place was awarded to the exhibit on histoplasmosis prepared by Drs. John A. Pryor, Clarence Cole, and Deane M. Chamberlain of the Colleges of Medicine and Veterinary Medicine, The Ohio State University.

Iowa Team Wins Golf Championship

There were 45 participants in the fourth AVMA golf tournament held at the Lincoln Hills Country Club in Milwaukee on August 23 during the AVMA convention. Winners of the state team championship were Drs. J. W. Sexton and C. C. Tucker of Iowa, who received the AVMA trophy for the coming year and also were awarded individual cups and knife sharpeners.

Dr. R. M. Stader, Rochester, Minn., won the individual championship with a gross score of 79, for which he received an electric clock that served as a trophy in this division.

Dr. Sexton, Sumner, Iowa, and Dr. L. A. Corwin, Richmond Hill, N. Y., tied for second prize—a blanket to Dr. Sexton and two dozen golf balls to Dr. Corwin.

The third division (exhibitors) was not represented this year.

In the fourth division (students), Mr. John W. Pierce of Missouri won the first prize of a dozen golf balls.

The fifth division, low ball team, was won by the Iowa team, Drs. Tucker and Sexton. Dr. Sexton had a big day! The prize in this division was steak knives.

Prizes were awarded for the longest drive, the least number of putts, the drive nearest the pin, and in the blind bogey. Dr. Sexton won a sport shirt for the longest drive; Dr. J. Delaney, Mt. Holly, N. J., also won a sport shirt for the least number of putts; Mr. Pierce, the student from Missouri, won a nice golf bag for the drive nearest the pin. Dr. Sam Elmer, Richland Center, Wis., and Dr. Edd Rash, Iowa Falls, Iowa, tied in the blind bogey. They were each awarded a pair of rain pants.

The prizes were awarded at a dinner at the Country Club following the tournament.

s/G. J. MAROLD.

Some Actions of the Executive Board and House of Representatives

The "Proceedings Book" of the 1951 Annual Meeting will contain the complete report of business transacted, but the following are items of special interest which merit mention here.

1) *Nominating Committee for Association Officers.*—A joint committee of the Executive Board and House was delegated to work out a plan for nominating the elective officers. This will involve amendment of the Constitution and Administrative By-Laws and the proposal will be submitted at the 1952 annual meeting.

2) *Proposal for Group Health and Accident Insurance Plan for Members.*—This was referred to the Executive Committee of the House for determination of the need and desire for such coverage by inquiry to the constituent associations.

3) *Applications for Recognition of Two Specialty Boards.*—The American College of Veterinary Pathologists, filed Feb. 10, 1950, and the

Dr. John B. Wells, as president-elect, presiding at the sessions of the House of Representatives.

American Board of Veterinary Public Health, filed July 31, 1950, were approved under the "Essentials of Approved Specialty Boards" set up by the Council on Education and adopted by the Executive Board and House of Representatives.

4) *Washington Representation.*—The House approved the recommendation of the Executive Board to set up some form of representation in Washington, D. C., to help on legislative matters that arise during sessions of the Congress and to assist with other veterinary matters coming before federal agencies. This had already been provided for in the 1951-1952 budget.

5) *Dues Increase Proposed.*—A resolution, which originated on the floor of the House and was presented by Dr. E. A. Grist, delegate from Texas, proposed an increase in annual dues in order that the Association would be able to carry on the added activities of recent years and also increase its reserves, was adopted and instruction given to prepare the necessary by-law amendments for final action in 1952. The increase proposed is not to exceed $5.00.

6) *Employee Benefit Plan.*—The Executive Board reported approval of an employee benefit plan of the employer-employee participation type by which contributions would be made to a retirement fund administered under a trust agreement. The plan is to be inaugurated this year and has been provided for in the current budget.

7) *Honorary Membership.*—The House elected to honorary membership Richard E. Shope, M.D., of Kingston, N. J., associate director of the Merck Institute for Therapeutic Research, and well known among veterinarians for his researches in swine influenza, pseudorabies, rinderpest, hog cholera, and other virus diseases of animals.

8) The publication of the proceedings of the Eighty-Eighth Annual Meeting in a separate volume was approved.

9) Plans are being made to issue a new AVMA Directory as early in 1952 as possible.

President-Elect and Other Officers Named at Milwaukee

Dr. Willard L. Boyd, dean of the School of Veterinary Medicine, University of Minnesota, St. Paul, was named president-elect of the American

President-Elect W. L. Boyd

Veterinary Medical Association at the eighty-eighth annual meeting. He succeeds Dr. John R. Wells, who assumes the AVMA presidency for the coming year.

Dr. Boyd was born Sept. 27, 1883, at Batavia, Iowa. He graduated from Kansas City Veterinary College in 1909 with the degree of D.V.S. Following graduation, he remained at the school for two years as an assistant to the late Dr. A. T.

The House of Representatives in session at the Milwaukee convention, August 18, 1951.

Kinsley in bacteriology and pathology. In 1911 he accepted a position as instructor in the Division of Veterinary Medicine at the University of Minnesota where he has since remained and where he was successively elevated to assistant professor (1913), professor (1918), and chief of the division (1940). In 1947 he was made director of the newly established School of Veterinary Medicine.

He holds membership in the AVMA, the Minnesota State Veterinary Medical Society, U.S. Livestock Sanitary Association, Conference of Research Workers in Animal Diseases of North America (president 1950-51), Minnesota Academy of Science, and the Society of Experimental Biology and Medicine. He is also a member of the Minnesota State Livestock Sanitary Board, the Stallion Registration Board, and the University Senate Committee on Intercollegiate Athletics; he also holds memberships in the honorary societies of Sigma Xi, Alpha Gamma Rho, Alpha Zeta, Gamma Sigma Delta, and Phi Zeta.

Throughout the years of his service at the University, Dr. Boyd identified himself with the clinical phases of veterinary medicine, especially the diseases of horses, cattle, and sheep. He has done special work in the reproductive diseases of cattle and on bovine brucellosis. In 1945, he received the Borden Award and Medal for outstanding research contributing to the control of dairy cattle diseases.

He has been active in AVMA affairs for years, having served on various committees, most notably the Committee on Education from 1943 to 1945 (chairman 1945) and then of the reorganized Council on Education from 1945 to 1950 (chairman, 1946 to 1950).

VICE-PRESIDENTS AND TREASURER

The vice-presidents elected at the convention for the year 1951-1952 are:

First Vice-President—Dr. E. A. Grist, New Braunfels, Texas.

Second Vice-President—Dr. C. C. Rife, Atlanta, Ga.

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Fifth Vice-President—L. C. Swan, St. Catharines, Ont.

Dr. W. A. Young, Chicago, was reëlected treasurer of the AVMA.

National Farm and Home Hour Broadcast

Taking part on Saturday, August 25, in the National Farm and Home Hour broadcast in Milwaukee, as a post-convention activity, were Mr. Paul Visser (left), agricultural director of the National Broadcasting Company; Dr. M. R. Clarkson, special assistant for Defense, Agricultural Research Administration, U.S.D.A.; Dr. W. R. Krill, chairman, AVMA Emergency Advisory Committee; and President John R. Wells.

Vital Statistics in Veterinary Medicine

J. H. WHITLOCK, D.V.M.

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RECENTLY THERE appeared in the JOURNAL of the AVMA an editorial entitled, "Who Knows the Cost of Animal Diseases?" This was a staid and sober account of the past history of the agitation for more accurate records dealing with the mortality and morbidity of farm animals. It was pointed out that the AVMA, the National Research Council, and the U.S. Livestock Sanitary Association all wanted essentially the same thing—to determine the incidence of diseases and their costs to the nation. Through all of this, there is apparent little opposition in the published reports. While, I suppose, there could be little opposition to the general idea, the premises on which most of the reports are based seem quite faulty while their conclusions are in similar case. Opposition seems to have been stifled by our modern worship of statistics.

Statistics are now popular, nay even fashionable. We are polled, graphed, charted, chi-squared, ranked and analyzed until the histogram has replaced the dollar sign as the mark of our civilization. We touch the "abracadabra" of science with the magic wand of correlation and a new wonder gleams. In fact, the wonder is almost unbearable—hence this essay.

Now I am not entirely opposed to statistics. I've used the discipline for a number of years, I've published two or three small papers on statistical problems and, for my sins, I've even conducted graduate seminars on the subject for veterinarians. Statistical methods have a definite place in veterinary research. They can be used as a shorthand to summarize a vast bulk of data and save printed space. They can be used as a super-control to indicate if the incidence of a phenomenon could be due to chance. They are useful in designing experiments. They are not a substitute for common sense. Properly used, they are common sense.

The fundamental idea behind the use of statistics is that you construct a mathematical model as nearly like the biological model as possible. Then you assume that the mathematical model acts like the biological one. Having made this important assumption, you fit your biological measurements, as abstract numbers, into the mathematical frame and make the model work. To do this you need to know:

1) How your biological model behaves;
2) How your statistical model behaves;
3) Whether the one is a reasonable facsimile of the other.

It is only within recent years that veterinarians have had to deal with problems using any degree of statistical complexity. Since they have not had to use statistics, they know little about it. It is not difficult to find published papers that need some statistical control and ignore it. Contrariwise, it is easy to find papers that are the result of cook-book statistics, cases where a mathematical model is applied to situations where it is demonstrably unsuited.

Statisticians can serve a biological discipline adequately only when the biologists (*i.e.*, veterinarians) are able to talk their language and intelligently criticize their suggestions and work. It is doubtful if many veterinarians are ready for the task. This deficiency is apparent even to the proponents of the plan. Their solution is to inaugurate courses in vital statistics in colleges. This is the same solution proposed by the people who want more courses in veterinary public health so as to make more public health veterinarians. There is a simple solution to both of these problems. To make more public health veterinarians they need to pay salaries that will attract our best graduates. To make veterinarians statistically minded, statistics must demonstrate that it pays by solving worth-while problems in veterinary medicine. My personal belief is that some day statistical reasoning will be an important attribute of every well-trained veterinarian, but it would seem more sensible to have it come gradually as the statistical approach justifies itself rather than have it superimposed by fiat from above. At any rate, there is now no considerable body of veterinarians who have sufficient statistical training to

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act as critics of the proposed program. Any veterinary program should have veterinarians as the ultimate authorities. At the present time, veterinarians would have to surrender this role to statisticians.

Now the fundamental premise upon which the need for morbidity and mortality statistics is predicated is that we do not know where our research and control efforts need to be concentrated. Such a premise indicates that skilled practitioners and pathologists are unaware of the important problems in their area. Granted that there are areas without competent veterinary service, it is difficult to see how statistics can overcome the difficulty. Are statistics going to help us to make a more intelligent guess in these areas, or are we going to move our already inadequate supply of trained pathologists to these localities that do not have sufficient livestock to command good veterinary service. I am very sure that a carefully selected conference of veterinarians could agree on the top disease problems facing the profession today without a real statistic entering the picture. Until we solve our major problems we do not need to worry too much about the minor ones.

Another premise in the proposed plan which seems to be faulty is the idea that there awaits us in the field of vital statistics a completely developed discipline which just needs to be applied in order to give us valuable information. While I am not a statistician, I seriously doubt such an idea. The mathematical models in human vital statistics are designed for a radically different situation than obtains in veterinary medicine. In human vital statistics, the time of births and deaths are recorded with considerable accuracy. The vast proportion of the human population in America never gets too far beyond the call and care of some sort of physician. Quite a large sample of the population has excellent and recorded medical service complete with nurses, stenographers, technicians, orderlies, and pathologists for their entire life. Not only that, but we count noses accurately every ten years and check up on the counts between times. Yet look how vital statistics in human medicine are tied to such simple records as birth and age. The birth rate goes up or down; infant mortality decreases; deaths from pneumonia in young persons decrease; and we feel considerable confidence in the figures because there are plenty of reasonably accurate checks. There are so very many first-rate organizations dealing with large numbers of sick and dying humanity that large sample statistical theory is applicable and has adequate biological control.

In veterinary medicine, however, there are relatively few places that are sufficiently well equipped to compile as accurate data as can be done by any large city hospital. Moreover, there are relatively so many more animals than there are veterinarians that the possibility of getting any large accurate sample is nil. We can not obtain birth or age data with any reasonable accuracy, while the small-time butcher and rendering plant gobble up the dying and the dead. Moreover, the shifting economic picture changes the animal population with extreme rapidity. Right now, in New York, hybrid corn is plentiful and many uninformed people are taking a flyer in the hog business. Most of the newcomers know nothing about hogs and many of them are going to lose their animals because of their ignorance. Within the short space of a year, the swine disease picture is going to change. What good does it do to record these deaths as malnutrition, cholera, necrotic enteritis, or whatnot. The etiological factor is human ignorance. We save our female animals for breeding by principles that vary from farm to farm. We butcher most of the males and the butcher is the number one cause of death. Wherein do our biologic models resemble those of human medicine? Actually, we must develop a whole new set of statistical models before we can do any sort of intelligent sampling. Our problems lie a lot closer to those of the ecologist than to the physician. This is particularly true if we consider the different kinds of animals we deal with and their different ideal and actual environments. Ecologists are making some progress in handling their statistical problems, but I doubt if even the most optimistic believes that he is comparatively much more advanced than the agronomist was twenty years ago, while the agronomist today is hardly satisfied.

My disagreement thus far has been qualified. I am for anything that will get intelligent *field* study of disease, particularly if it is backed up by careful laboratory and postmortem work. I would even be willing to invest cautiously in exploration of the distribution of diseased animals and appropriate mathematical models. But, high on my private list of

things I can do without is another federal bureau complete with calculating and mimeographing machines with nothing to do but dream up questionnaires to make my life miserable. No one has emphasized this side of the picture sufficiently. Most veterinarians I know do not have a battery of clerks, stenographers, and interns to take up the drudgery of the form in triplicate. Just offhand, I can't think of a better way to collect biased data either. The busy, successful individual will either skimp his answers or not answer at all, while the fellow with leisure may take time to answer.

It is difficult to understand how economists have any part to play in this scheme at all. Are we to understand that a considerable segment of informed veterinary opinion believes that the economists know what they are doing? Judging by their controversies, the economists are not entirely sure. I can understand what 100 dead rams look like and the tragedy they represent. I think they probably represented the same thing at the time Moses conducted biological warfare against the Egyptian herds. Dealing with animals, it would seem as though we already had a reasonably stable value. The green paper in my wallet has developed certain peculiar characteristics with relation to cows. Why are we so anxious to introduce still other variables in this situation? We already have excellent examples available of the crossing of poor statistics with questionable economics. The ox warble is commonly referred to as a multimillion dollar problem. If this were really true, a complete radical control operation might be justified on the grounds that it would pay for itself. But consider the way that this figure is arrived at. Warble-free hides are rare and bring a premium. Warble-damaged hides are common. A large part of this multimillion dollar value is arrived at by multiplying the price differential by the number of damaged hides. Now surely nobody is so naive as to believe that if we wiped out the ox warble overnight that the price of beef would promptly rise the differential value. When sound hides are common, they'll be cheap. Admittedly, the warble also damages some meat. Suppose we persuaded the farmers not to market animals during the period when the warbles were in the back. It is not inconceivable that the beef market might get so tight that warble-infected carcasses might bring a premium.

The last time I asked one of the warm advocates about this multimillion dollar business he admitted the shakiness of the statistics and economics but justified it as one more step toward the "more abundant life." Veterinary medicine has enough real problems without getting involved in Epicurean philosophy. This is not to deny that the ox warble causes some loss to the nation but it is to deny high priority to it, as long as we have a whole galaxy of diseases that will put a man out of the sheep or hog business or cut milk production in half.

Confusing the picture with dollars is more likely to get research emphasis misdirected than properly directed. Veterinary medicine is admittedly an economic profession, but it deals in the basic economy of civilization, in herds and flocks, which are a measure of the real wealth of the nation. The value of a dollar is here today and gone tomorrow. A man who owned a hundred head of cattle and sufficient feed has been well off for most of the several thousands of years of recorded history, but a man who owns $100 today is not as well off as the man who owned $100 fifty years ago.

In summary, the four weakest points of the proposed plan seem to be the insistence by its proponents (1) that veterinary science today does not know its real problems; (2) that present statistics will correct this alleged deficiency; (3) that dollar economists have any major place in veterinary medicine; and (4) that statistics is a safe tool for biologists who know little or no statistics. There are numerous other flaws but these are the major ones.

Thus far, our real progress in veterinary medicine has seemed to be based on real scientific principles. Since the tried principles are still productive, it is difficult to see how extensive involvement of our energies in highly questionable mathematics is any advantage. The day that veterinary service is based on phony dollar values instead of appreciation by the individuals of the livestock and small animal community is the day that veterinary service as we know it will disappear. If there be any others who are dubious about this vital statistics program, they are herewith cordially invited to come drag their feet with me. I am very reluctant to see my profession reduced to one pipe on somebody's propaganda organ.

Salvage Through Slaughter

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THE INCREASED dollar value placed on livestock in recent years has brought about a more careful consideration of the general health and well-being of each animal from the farm to the slaughtering establishment. Veterinary practitioners are frequently called upon to express their opinion whether an unsound animal, on the farm, is (1) wholesome for human consumption on the farm, and (2) whether it would be more economical to send the animal to slaughter for the salvage value of the carcass rather than to continue treatment of an existing ailment or condition. Such questions are common in feedlot animals that are not making satisfactory gains necessary to realize a profit above the cost of feed and labor.

Before the veterinary practitioner offers advice to livestock owners, he should be familiar with two important facts:

The livestock buyer at practically every slaughtering establishment is aware of many diseases and conditions which may cause retention of an animal or its carcass under existing regulations of the Federal Meat Inspection Service. He has gained this knowledge through losses he has taken in the past. As a result, buyers will not purchase visibly unsound animals without a restriction. They will accept for slaughter such animals only on a "consignment basis," "grade and yield basis," or as a "suspect." In each case, the payment for the animal is not made until it has passed antemortem and postmortem examinations. If the animal is condemned on either examination, the owner assumes the entire loss.

The veterinarian should possess a working knowledge of Federal Meat Inspection Regulations as they pertain to the restrictions imposed on unsound animals at time of antemortem inspection.

The purpose of this paper is to outline briefly inspection procedures and regulations as they apply to diseases and conditions seen at time of antemortem inspection. Much of the following information is made available from the January, 1947, edition of "Regulations Governing the Meat Inspection of the United States Department of Agriculture."[1]

An antemortem inspection is made by a veterinary meat inspector, on the premises of a slaughtering establishment, of all cattle, sheep, swine, or goats before their slaughter is allowed. Such inspection is made on the day of slaughter and the animals are classified as normal, U. S. suspect, and U. S. condemned.

Normal animals are those which appear healthy, thrifty, and visibly free from diseases or conditions which may cause retention at time of postmortem examination.

U. S. suspects are animals not plainly showing, but suspected of being affected with, a disease or condition which may render a part or all of their carcasses unfit for food. They are tagged with a U. S. suspect ear tag, and, accompanied with an identification form, are allowed to be slaughtered. The identification form gives the veterinary meat inspector in the slaughtering department the following information: U. S. suspect tag number; kind of animal and sex; disease or condition suspected; temperature reading; approximate weight; other remarks which may more fully describe the cause of retention; the name of the inspector who conducted the antemortem examination, and the date it was made.

U. S. condemned animals are those plainly affected with a disease or condition which would cause condemnation of their carcasses at time of postmortem examination. They are tagged with a red U. S. condemned ear tag. Such animals are not permitted to be dressed or otherwise handled in a slaughtering department. If not held for treatment, observation, or otherwise, U. S. condemned animals are killed by an employee of the establishment and the carcass tanked. The term "tanked" means an approved method used in federally inspected establishments to destroy effectually a carcass for food purposes.

The following diseases and conditions are listed as examples of animals tagged U. S. suspects or U. S. condemned, including a

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brief statement as to their disposition at time of antemortem examination.

Pyrexia.—Any swine having a temperature of 106 F. or higher, and any cattle, sheep, or goats having a temperature of 105 F. or higher are tagged U. S. condemned. If cause of fever is in doubt, or for other reasons such action appears warranted, any such animals may be held for a reasonable time for further observation and taking of temperatures before final disposition is made. If after a holding period of a reasonable time such fevers persist, affected animals are tanked.

Moribund.—Animals received for slaughter and found in a dying condition are tagged U. S. condemned.

Comatose or Semicomatose.—Such animals are tagged U. S. condemned and may be set apart and held for further observation or treatment under responsible official supervision.

Boars and Stags.—All boars which are sexually mature and swine stags which show evidence of recent castration are tagged U. S. suspects.

Immaturity.—Animals which are regarded as immature are tagged U. S. suspects. Such animals may be held under division or other responsible official supervision and after sufficient development may be released for slaughter.

Cripples and "Downers".—All seriously crippled animals and animals commonly termed "downers" are tagged U. S. suspects.

Rabies.—All animals showing symptoms of rabies are tagged U. S. condemned.

Tetanus.—All animals showing symptoms of tetanus are tagged U. S. condemned.

Parturient Paresis.—All animals showing symptoms of parturient paresis are tagged U. S. condemned. Cattle may be set apart and held for treatment. If after expiration of the treatment period the animal is found to be normal, it may be released for slaughter.

"Railroad Sickness".—(A severe nervous disorder sometimes observed in cattle as a result of railroad transportation.) Animals affected are tagged U. S. condemned. They may be set apart and held for treatment. If after expiration of the treatment period the animal is found to be normal, it may be released for slaughter.

Hog Cholera.—All hogs plainly showing they are affected with hog cholera are tagged U. S. condemned. Those suspected of being affected are tagged U. S. suspects providing temperatures do not exceed 106 F. U. S. suspects, and those having temperatures of 106 F. or higher, may be set apart and held for treatment. If after expiration of the treatment period the animal is found to be free from disease, it may be released for slaughter.

Recent Vaccination.—Swine, other than hyperimmune swine, are tagged U. S. condemned if offered for slaughter within twenty-eight days after injection with hog cholera virus.

Hyperimmune Swine.—These animals are tagged U. S. condemned if offered for slaughter within ten days after hyperimmunization.

Epithelioma.—Cattle affected with epithelioma of the eye and of the orbital region in which the eye has been destroyed or obscured by neoplastic tissue and which shows extensive infection, suppuration, and necrosis, usually accompanied with foul odor, or animals affected with epithelioma of the eye or of the orbital region which, regardless of extent, is accompanied with cachexia, are tagged U. S. condemned. Those found to be affected with epithelioma of the eye or of the orbital region to a lesser extent are tagged U. S. suspect.

Anthrax.—All animals affected with anthrax are U. S. condemned. Other than hogs, apparently healthy animals of a lot in which an animal was found to be affected with anthrax are held for treatment by a competent veterinarian under division or other responsible official supervision. Cattle, calves, sheep, or goats, when treated with anthrax biological products which do not contain living anthrax organisms, shall not be presented for postmortem inspection in less than twenty-one days following the last treatment or the last death. Note: Anthrax vaccine (live organisms) shall not be used on the premises of an official establishment.

Anthrax Vaccinated.—Animals which have been injected with anthrax vaccine (live organisms) within six weeks, and those bearing evidence of reaction to such treatment, such as inflammation, tumefaction, or edema at the site of the injection, are tagged U. S. condemned. Such animals may be held under division or other responsible official supervision until the expiration of the six-week period and the

disappearance of any reaction to the treatment.

Anasarca.—All cattle found to be affected with anasarca in advanced stages and characterized by an extensive and generalized edema are tagged U. S. condemned. Those found to be affected to a lesser degree are tagged U. S. suspect. An animal suspected of being affected with anasarca may be set apart and held for treatment. If at the expiration of the treatment period the animal is found free from disease, it may be released for slaughter.

Tuberculin-Test Reactors.—Animals which are known to have reacted to the tuberculin test are handled as U. S. suspects.

Swine Erysipelas.—All hogs plainly showing they are affected with acute swine erysipelas are tagged U. S. condemned. All hogs suspected of being affected with swine erysipelas, and whose temperatures do not exceed 106 F., are tagged U. S. suspect. The U. S. suspects, and those have temperatures of 106 F. or higher, may be set apart and held for treatment. If after expiration of the treatment period the animal is found to be free from disease, it may be released for slaughter.

Pregnancy or Recent Parturition.—Animals in advanced stages of pregnancy (showing signs of parturition) and those having recently given birth to young are tagged U. S. suspects. Slaughter is not required. Such animals may be held at the establishment for not less than ten days. At the completion of this holding period, and if the animals appear normal, they may be released for slaughter.

Vaccine Animals.—Animals with unhealed lesions of vaccinia, accompanied with fever, which have not been exposed to any other infectious or contagious disease, are not required to be slaughtered and may be released for removal from the premises. Otherwise, such animals are tagged U. S. suspects.

Brucellosis-Reactor Goats.—Goats which have reacted to a test for brucellosis shall not be slaughtered in an official establishment.

Vesicular Diseases.—(*a*) Immediate notification shall be given to the local state and federal livestock sanitary officials having jurisdiction when an animal is found to be affected with a vesicular disease.

b) No animal under quarantine by state or federal livestock sanitary officials on account of a vesicular disease will be given antemortem inspection.

c) If no quarantine is invoked, or if a quarantine is invoked and later lifted, antemortem inspection shall be as follows:

1) Any animal affected with vesicular exanthema or vesicular stomatitis in the acute stages, as evidenced by acute and active lesions or an elevated temperature, shall be tagged U. S. condemned.

2) Any animal affected with vesicular exanthema, or vesicular stomatitis, but which has recovered to the extent that the lesions are in process of healing, the temperature is within normal range, and the animal shows a return to normal appetite and activity, shall be tagged U. S. suspect. If desired by the owner, such animal may be set apart and held for treatment. If the animal is set aside for treatment, the U. S. suspect tag will be removed by a division employee, either when the animal is released for treatment to a responsible official or following treatment while under the custody of a division employee if the animal is found to be free from disease. Such animal, found to be free from disease, may be released for slaughter or for purposes other than slaughter, *provided* that in the latter instance, the offical establishment or the owner of the animal shall first obtain permission from the local state or federal livestock sanitary official having jurisdiction of the movement of such animal.

Any animal condemned on account of hog cholera, swine erysipelas, vesicular exanthema, vesicular stomatitis, railroad sickness, parturient paresis, anasarca, or inflammatory condition including pneumonia, enteritis, and pertitonitis, may be set apart and held for treatment under division or other responsible official supervision. The U. S. condemned tag will be removed by a division employee either when the animal is released to a responsible official for treatment, or following treatment under division supervision if the animal is found to be free from disease. When an animal is to be released for a purpose other than slaughter, the official establishment or the owner of the animal shall first obtain permission for the movement of such animal from the local state or federal livestock sanitary official having jurisdiction.

When parenteral injections of medica-

ment containing dyes, camphor, and the like, are used in the treatment of livestock, the veterinary practitioner should inform the owner that treated animals be held from slaughter for a sufficient period of time for the animal body to entirely absorb and eliminate the substances. The presence of medicinal odors, discoloration of body cavities, or massive accumulations of medicants in subcutaneous tissues are causes for condemnation of the carcass at time of postmortem examination. (It has been reported that methylene blue used in antidote solutions, and camphor, when used as camphor in oil intramuscularly, may be detected in an animal carcass as long as two weeks following administration.)

More than 77 per cent of all cattle, calves, sheep, and swine slaughtered commercially during 1948 and 1949 were slaughtered under the supervision of the Federal Meat Inspection Service. For the purpose of pointing out the economic loss suffered annually by the livestock and meat packing industries, the condemnations for the fiscal year 1950 (July 1, 1949 to July 1, 1950) are cited.[2] At time of antemortem inspection, there were 2,765 cattle, 610 calves, 564 sheep, 6 goats, and 2,874 hogs condemned. At time of postmortem inspection, there were 64,279 cattle, 33,912 calves, 59,730 sheep, 443 goats, and 135,825 hogs condemned. The latter figures include those animals which had been tagged as U. S. suspects at time of antemortem examination.

Conclusion

In conclusion, veterinary practitioners can be of assistance to livestock owners by advocating treatment of animals afflicted with diseases or conditions, which may be classed as having a favorable prognosis, on the farms or in the feeding pens, and recommending immediate shipment for slaughter purposes of those animals afflicted with diseases or conditions which may be classed as inoperable or uneconomical to treat. It is sound and practical to advise castration of all boars, and to hold swine stags with unhealed wounds on owner's premises until complete healing is evident; to withhold shipments of animals in advanced stages of pregnancy and for ten days following parturition; to withhold shipments of recently treated animals especially when medicants containing dyes, camphor, and the like have been used; and when it is known shipments of recently vaccinated animals are destined for slaughter, the restrictions pertaining to vaccinated animals should be made known to the owner. Moribund animals should be disposed of on the farm or in the feeding pens and the veterinarian should discourage shipments of such animals to a slaughtering establishment for a possible salvage through slaughter.

References

[1]Regulations Governing the Meat Inspection of the United States Department of Agriculture. Edition of January, 1947: 21-29.

[2]Pamphlet: Meat Inspection Service, Summary of Activities, Fiscal Year 1950.

Laparotomy in Horses

Ever since the teachings of Lister and Pasteur literally *opened* the abdominal cavity to the gaze of the surgeon, veterinary surgeons have conveniently nursed the idea that the peritoneum of horses is especially sensitive to infection. Much less was said about the difficulty of surrounding so large an animal with the necessary "aseptic veil," the complexity of restraint and positioning, the hazards of prolonged general anesthesia, and guarding the vast incision against postsurgical injury.

The obstacles have been, still are, and always will be not too easy to resolve. But, the real truth is that the alleged sensitivity of the horse's peritoneum *per se* is an *excuse*, not a *cause*, for dodging major abdominal surgery in horses—*excuse* because competent authorities have demonstrated that the peritoneum of the horse is no less tolerant than that of other animals. Cadiot and Almy (*Traite de Thérapeutique Chirurgicale*) emphasize that the sensitivity of the peritoneum of the horse has been "strongly exaggerated." The misused word *laparotomy* is particularly appropriate in equine surgery, inasmuch as any site of invasion other than the flank can be ruled out entirely.

Cortisone in Rheumatoid Arthritis.—A case of rheumatoid arthritis was successfully treated for eight months with cortisone. After an initial period of treatment with high dosage, maintenance dosage has been reduced—gradually at first—to the lowest level short of provoking relapse.—*Brit. M. J., June 30, 1951.*

Domestic Rabbit Raising

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DOMESTIC RABBITS are raised for fun, fur, and food. Approximately 30 recognized breeds in the rabbits standards have been developed from about 6 main breeds. The standard breeds are classed as fancy or commercial. The raiser of fancy breeds usually has a small herd of one or more types considered fancy due to color markings or size. These are raised as a hobby, for show, and for selling breeding stock. A commercial herd, regardless of its size, is raised for meat and, to a lesser extent, fur and other by-products. It usually contains several hundred rabbits developed from stock proved to produce meat economically.

The so-called hobby of raising rabbits of a few years ago has grown into an industry. Nevertheless, the demand for domestic rabbit meat far exceeds the present production. California, which probably leads all other states in this field, has processing plants from which packaged, frozen domestic rabbit meat is shipped to various retail centers in other states.

Great advances have been made in the rabbit industry through the aid of the American Rabbit and Cavy Breeders Association; the U.S. Rabbit Experiment Station, Fontana, Calif.; the Bureau of Animal Industry, Agricultural Research Administration; and the Fur Farming Division of the U.S. Department of Agriculture research center at Beltsville, Md.

Prevention of disease is important, as medication after a disease strikes does not give the desired results. If first aid treatment is not successful, further medication usually is disappointing. Like any other industry, the raising of domestic rabbits must be run on a business basis. Rabbits raised in sanitary hutches are not subject to infections and diseases acquired from filthy pens or from being housed on the ground. Tularemia has not been found in domestic rabbits, to the best of my knowledge.

HOUSING

The hutches should be so constructed that sanitation can be maintained with a minimum of labor through self-cleaning construction, ample light, plenty of room (about 1 sq. ft. of floor space per pound body weight per doe), and the prevention of drafts. Housing varies according to the climate in which the rabbits are raised. In colder climates, the hutches should be well constructed of heavy material in order to supply warmth and dryness. In warmer climates, lighter material can be used, keeping in mind proximity to trees or shrubbery to supply shade. Hutches vary in construction and the space allotted to the rabbitry will influence the type. Inside hutches may be all metal, but outside ones must provide their own protection. In the warmer climates, probably wire floors of ½-in. hardware cloth are the most popular; while in the colder climates, wooden floors are desirable. The framework of most consist of boards on three sides with mesh wire doors, and either wire or wooden floors. The roof should be of durable material, usually solid boards covered with shingles or roofing paper. In sections where the summer heat is intense, a double roof is desirable, *i.e.*, about 18 to 24 in. are allowed between the roofs to furnish ventilation and protection from the heat.

BREEDING

Breeding stock should be bought from a reliable breeder. A prospective breeder should visit rabbitries to see the methods used in raising good stock, and should obtain rabbits that conform to the standard requirements of the breed, including ample milk production, good fur, and desired weight.

Inbreeding is permissible if the desired qualities on which to build a herd are present and outweigh the faults. The success of inbreeding will depend upon constant observation and checking.

Cross-breeding should be done only by an experienced breeder who understands genetics; this is necessary to develop any stock that is better than the parent stock, or to develop a new breed.

One buck is usually sufficient to care for 8 to 10 does. The fancy breeds for show purposes or breeding stock should produce

about four litters a year. In a commercial herd, 1 good doe may be expected to produce five litters a year. However, rapid breeding of does will reflect in higher doe replacements.

Some herd bucks may become sterile in the hot summer months unless protected from the heat. They usually become fertile again in the fall. The failure of some does to conceive may be due to several factors, including disease, obesity, any temporary ailment, excessive heat, overwork, improper diet, a sterile buck, and molting which probably heads the list. Forced breeding may be resorted to with some does, but the results are usually disappointing. Some does that fail to breed can be encouraged by putting them in a double hutch and separating them by a wire partition from an active buck.

The age at which domestic rabbits should be bred varies. The smaller breeds that mature under 5 lb. can be bred at 4 months of age. The medium breeds that mature around 10 to 12 lb. should not be bred until they are 6 to 7 months old and weigh 9½ to 10 lb. Larger breeds that mature at 14 to 20 lb. should not be bred until they are 8 to 9 months old when they will probably weigh over 12 lb. A young doe that has been permitted to reach her mature weight before being bred will usually raise better litters. Heredity is an important factor in young rabbits reaching the proper weight for their age.

FEEDING

Rabbits should be fed regularly, using the same feed if possible. When a change is necessary, it is best to make the change gradually in order not to disturb the digestive tract. Changing feed and feeding methods is inviting trouble and possibly disease. A rabbit does not require a large amount of feed to keep it in a healthy condition. The amount a dry doe or buck will clean up in 15 to 20 minutes is sufficient for twenty-four hours. Most rabbits, especially in commercial herds, are fed a pellet ration which is a balanced diet; therefore, little additional feed is necessary for proper growth and to maintain a healthy condition. A self-feeder should be provided for a doe and her litter so they may consume larger amounts of feed in order to gain weight rapidly and reach market weight sooner. A self-feeder with any good hay is desirable for growing litters, in addition to the pelleted ration.

Most pelleted rations average about 16 per cent protein. If the protein percentage is higher, any hay, such as prairie or timothy, is suitable for any additional feed. If the percentage of protein is less, good alfalfa hay is recommended. Hay is good for growing bunnies and gives them something to do other than fur-eating or hutch-gnawing.

MANAGEMENT

Eight weeks after the bunnies are born, or twelve weeks after the doe has been mated, each fryer will produce 2 to 2½ lb. of tender, all-white meat with a nutritive value of 83 per cent, compared with chicken, 50 per cent; pork, 60 per cent; and beef, 75 per cent. Fryers can be sold by live weight or can be butchered at home to supply local demands.

The fur from the normally haired or rex-furred rabbits and the wool from the Angora rabbits have commercial value.

Does that eat their young at birth usually have a reason such as being moved to a new hutch when she is near kindling, improper diet, or being frightened by strange surroundings, stray cats, dogs, rats, or mice. It is suggested that such does be given another chance under proper conditions as, in most cases, it is the fault of the owner and not the doe.

In cases where the doe drags the young out of the nest box while they are nursing, it would be well to heighten the side of the box so that the bunnies would be pulled from the nipples on the edge of the box and fall back into the nest. Sometimes, the doe deliberately carries them out of the nest box, due to the location of the box, and may try building a new nest on the wire in a corner of the hutch. If it is possible to keep the bunnies in their nest box for eighteen to twenty-one days after they are born, it will give them that much more time to develop so that the feed can be digested easier. About this time, the bunnies should have their eyes completely open. Sticky eyelids can be treated with an application of boric acid solution on a cotton swab. If several in the same litter are so affected, a new nest box with new bedding should be furnished after their eyes have been washed.

In some cases, when a doe has a litter of

8 or more, it is a good policy to give some of them to a foster mother with a small litter of approximately the same age. Several precautions may be necessary in order for the foster mother to accept these new bunnies. The foster mother may be locked out of her nest box for an hour or so in order that the new bunnies may acquire the nest odor and not be detected by her. If time is a factor, place a dab of any aromatic ointment on the dewlap and chin of the doe, which will prevent her from smelling the new babies.

In instances where the bunnies have to jump over a high box to get out for additional food, when the doe has insufficient milk, crooked legs may develop because the bones of the legs are immature and are easily bent by the constant jumping. In a hutch with a slanting wooden floor, which becomes slick, bunnies may develop crooked legs, due to the constant spradling or slipping. The floors should be roughened with a wire steel brush, given a coat of nonpoisonous paint, and sprinkled with fine sand just before it dries, or the wooden floor should be replaced with ⅝-in. hardware cloth.

Paralysis of adult stock is brought about by various body injuries which cause pressure on a nerve. Possibly, improper ration may be an influencing factor in does that have been overworked, especially if it is posterior paralysis following kindling.

Fur-eating among young rabbits can usually be attributed to an overcrowded hutch or a deficient ration. It is recommended that more hutch room be furnished and green limbs or hay be supplied.

Poor appetite may be due to unpalatable food and can be corrected by supplying carrots, apples, or other succulent food.

Impaction of the digestive tract may be due to hairballs or common foodstuffs. Slight massage of the abdominal region along with the administration of 1 tablespoon of caster oil usually gives good results.

DISEASES

Mastitis is rare in domestic rabbits. The congestion of the mammary glands and the associated inflammation should be treated by a gentle massage with an analgesic ointment over the tender area. In serious cases, lacing the mammary gland may be necessary, followed by usual treatment of an open wound.

Mucoid enteritis is probably the most common trouble affecting growing fryers or older stock. The rabbits go off feed, sit aside from the litter, squint their eyes, and usually grind their teeth. Their desire for water is increased; hence a bloating condition appears with a watery diarrhea and the passage of a clear mucus. Severe constipation many be present in a few cases. If this condition is noticed early, administer 1 teaspoon of raw linseed oil every twelve hours and remove all food and water for thirty-six hours. If they respond, they can be started back on feed with a sparing amount of green succulent food and a few sips of water daily. This condition is not infectious or contagious but is known as a digestive upset of undetermined cause. However, isolation is a good practice. Enteritis may affect the entire litter but more often it affects only 1 or 2 in a litter. Adding timothy, oat, or prairie hay to the regular feed helps to counteract this ailment.

A condition called "hutch burn," a raw area around the vent due to urine-soaked filth, may be remedied by removing the rabbit to a sanitary hutch with a wire floor. The hair should be clipped around the raw area and treated with an ointment of lanolin and sulfur.

Common colds of bacterial origin cause a severe inflammation of the mucous membranes of the respiratory tract resulting in a purulent copious discharge from the nostrils. Stained matted fur of the medial surface of the forepaws, due to the constant wiping of the nose with the forefeet, is a symptom. In severe cases, slaughter is recommended.

Sore ears due to scab mites is common in some rabbitries where care is lacking. These mites form scabs inside the lower portion of the ear and, in severe cases, may extend the full length of the ear if the rabbit lives that long. A few drops of ear oil used regularly will soon correct this condition. A good ear oil can be made from 19 parts sweet or olive oil with 1 part phenol. Treat ears every three to five days until cured.

Wry neck is not a common condition in domestic rabbits. It is described as an internal ear disease causing the rabit to lose its equilibrium. Twisting the head until the rabbit falls over is the most obvious symptom. It will soon right itself again but only to repeat the procedure.

Mites may cause the condition, but if so, oil treatment for mites is not satisfactory due to the depth of the mite in the ear; therefore, slaughter is recommended.

Sore hocks, usually affecting the soles of the hind feet, may be due to a dirty, unsanitary hutch that keeps the pads of the feet soaked with urine; floors that have sharp surfaces; or lack of fur on the soles of the feet. If these areas become infected and have to be lanced, they should be treated as an open wound with any good antiseptic ointment. Some rabbits get well without much treatment if they are put in a clean, dry pen until the sores have healed.

Buck teeth is the abnormal growth of the front four teeth due to sinus infection that disturbs the roots of the teeth, failure of the teeth to match properly, or heredity. Rabbits with buck teeth should not be used as breeding stock. Fryers that develop this condition can be treated by cutting off the teeth regularly until the rabbits have gained enough weight so they can be butchered.

Tapeworm cysts, due to the larva of *Taenia serrata* of the dog, may appear on any portion of the body as soft fluctuating areas of varying size. When these areas are opened, a clear fluid containing larvae of the tapeworm drains out. These cysts are due to the ingestion of feed that has been contaminated by fecal material from an infected dog.

Runny eyes usually are due to the stoppage of the lacrimal duct. If they do not respond to common eye ointments or eye washes, this trouble will probably remain and slaughter is recommended.

Occasionally, mange mites and fleas will be found on domestic rabbits raised on the ground. This condition can be corrected by putting rabbits in a wire-floored hutch.

Slobbering or drooling causes the fur under the chin and dewlap to become matted and results in a raw area with a foul odor. To combat this condition, reduce the regular ration, remove any green feed, shear the hair from the affected area, and apply a healing powder.

Literature on the various aspects of rabbit-raising may be obtained from the American Rabbit and Cavy Breeders Association, through local or state rabbit clubs, bulletins from the U.S. Rabbit Experiment Station at Fontana, Calif., and from county agents.

Actinomycosis in Northeast Scotland

Within recent years it has been recognized that actinomycosis, although not a common disease in man, can not be considered rare. In the past there has been much difference of opinion on whether those engaged in agriculture were specially liable to this disease.

The results show that the attack rate among farmers was 1 in 250 and in the remainder of the male population 1 in 2,900, the difference between these rates indicating that males engaged in farming are more liable to develop this disease than those in nonagricultural occupations.

Eleven cases of actinomycosis occurred in members of the Armed Forces in this area. Ten of these occurred in men who were strangers to northeast Scotland. It may be that there is a greater liability to develop this infection in that climate, or it may be that the conditions under which the troops were living played a part in the production of the disease.—*Brit. M. J., June 16, 1951.*

Healthy Cows Produce Quality Milk

"The dairyman's first line of defense is healthy cows. He practices some of the same principles that wise parents use in protecting the health of children. A clean, comfortable environment, defense against disease, a balanced diet, and even keeping the cows happy are important factors in cow health.

"Knowing that milk from diseased animals may be a source of bacteria which cause disease in man, dairymen must maintain a constant program of cow health protection."

These remarks appear early in "Quality Milk—A Symbol of Democracy" by J. A. King and released by the National Sanitation Foundation. This illustrated booklet of 40 pages is dedicated to better living through the encouragement of sanitation.

It is now clear that for an adequate supply of carbohydrate the animal must depend to a large extent, especially during the periods of gestation and lactation, on the processes of gluconeogenesis from such possible sources as propionic acid, protein, and the glycerin portion of fat.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

A Report of Artificial Insemination, Factors Affecting Reproduction, and Semen Studies in Sheep of the Highland Pastures of Southern Peru

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Lima, Peru

ONE PURPOSE OF the Junta Lanar is to sponsor an extensive improvement program in sheep breeding and management. Since there are very few stud farms in Peru producing good quality rams of excellent breeding, it has been necessary to import rams in most cases where an improvement program was under way. Because of the high cost of improved imported rams, very few good rams have been imported. To overcome this difficulty and to obtain maximum use of the rams imported, artificial insemination was introduced and a laboratory established at Chuquibambilla the latter part of April, 1942.

Chuquibambilla is located in southern Peru in the Sierra (high altitude grasslands) at an altitude of 12,828 ft. above sea level. The annual rainfall from November through April is about 26 in. Being near the equator, there is a wide spread between the daily minimum and maximum temperature, especially during the winter.

During the dry season, most of the livestock in the Sierra lose weight and are thin by the time the spring rains begin. The rate of stocking on most ranches is 2 to 4 sheep per hectare (2.47 acres). Aside from salt that is fed in some cases, there is practically no supplemental feeding. Many flocks are infected with scabies, ticks, liver flukes, intestinal worms, and tapeworms, but only a few are treated regularly.

A large percentage of the sheep in this area show some Merino and Corriedale breeding, yet many of them are unimproved native Chusco stock. The sheep of most of the flocks which show some improvement are small and have an average wool production of 2 to 4 lb., which is far below the average for the Merino and Corriedale breeds. This light weight and low wool production is probably due to a combination of several factors: (1) low plane of nutrition, due to overgrazing and lack of supplemental feeding to balance the ration; (2) an acute mineral deficiency; (3) poor management practices; and (4) parasitism.

The chief breeding season seems to be from April through July with another season from October to the latter part of December; however, there are some lambs dropped in every month of the year. The breeding period on the individual ranches lasts from six weeks to two months, using 5 to 7 rams per 100 ewes. The average lamb crop varies from 40 to 70 per cent. A few of the ranches which practice better management and do some supplemental feeding report a lamb crop of 80 to 90 per cent.

With this low rate of sheep fertility in the Sierra, the need for determining the cause is evident. Although it is a common belief that the altitude has a drastic effect on reproduction in sheep, it is doubtful that the altitude alone would produce such an effect in native sheep and in imported sheep which have become acclimated. It is regretted that the time and facilities for studying this problem have been limited, yet some pertinent data have been obtained.

All rams used in this work were imported, registered rams of Merino, Corriedale, or Karakul breeding. Each ram appeared normal physically and exhibited normal sexual desire. The age of these rams ranged from 1½ to 5 years and their period of acclimatization in the Sierra varied from six weeks to eighteen months. During this time, they were kept on native pasture and given salt regularly. Beginning about the first of May, the rams used for the artificial insemination work were given a supplement feed of alfalfa, grain, and a mineral mixture.

The semen used in this work was collected by the use of an artificial vagina. Since the temperature of the room in which the collections were made was often as low as 50 F. (10 C.), great care was taken to see that the vials into which the semen was ejaculated were sufficiently warm to avoid any temperature shock to the spermatozoa. Immediately after collection, the volume

Credit is due the Granja Modelo de Puno at Chuquibambilla for their coöperation in making this work possible by furnishing many of the facilities and animals.

From Junta Nacional de la Industria Lanar, Lima, Peru.

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of each sample was determined and the motility checked. Motility was rated from 5 to 0; the best being 5, and 0 representing no sperm movement whatsoever. All semen samples were held at a temperature of 20 to 30 C. until used or until cooling was started. In cases where the percentage of live sperm in a semen sample was determined, smears were made using the standard opal blue-eosin staining mixture and the percentage of unstained sperm were counted. Phillip's yolk-phosphate diluter was the only diluter used and was always warmed to 25 or 30 C. before adding to the semen.

ARTIFICIAL INSEMINATION

As it was the plan of the Junta Lanar to serve as many ranches as possible, it became necessary to divide the ranches desiring this service into six groups according to geographic location. Artificial insemination was then carried out in each group for eight days, working at every ranch each day. Work was started in the first group on May 2. Most of the ranches selected their better ewes, but some native ewes were inseminated. The ewes from a few of the ranches received salt regularly, but most of them received nothing in addition to their native pasture. The selection once a day of ewes showing estrus was made by the use of 2 to 4 rams (wearing aprons) per 100 ewes. Usually, this period of selection lasted one to two hours, the ewes exhibiting estrus being removed from the flock as they were found. As the supervision was left entirely to the ranch operators, it is doubtful if this selection was accurate in all cases.

A total of 7 rams which consistently produced normal semen were used. The general practice was to collect the semen in the morning — two or three ejaculates from each ram. Then all ewes found in heat that and the following day were inseminated with these samples. Only semen samples which appeared normal in every respect and showed a motility of 4 or 5 were used. The dilutions of all semen used ranged from 1:4 to 1:8, and were always made within thirty minutes after collection. The diluted samples which were not to be used immediately were then placed in a water bath at 20 C., which was gradually cooled (in about 3 hours) to 1 or 2 C., at which temperature they were stored until used — from 1 to thirty-six hours. Only a few ewes were inseminated with freshly ejaculated semen. Most of the stored samples showed a motility of 5, but never below 4, after thirty-six hours of storage. In most cases, a standard volume of 0.2 cc. of the diluted semen was used for insemination, but a few ewes were inseminated with a volume of 0.1 and 0.4 cc. The work was so arranged that insemination was usually performed two or three hours after the ewes were selected. Each ewe received only one insemination. The facilities for working on many of the ranches were poor and some of the ewes were subjected to a great deal of running and excitement both before and after insemination.

Of a total of 4,300 ewes inseminated, 3,628 were bred to 4 of the best rams, 1

TABLE 1—Breed, Age, Date of Importation to Sierra and Semen Characteristics of All Rams Studied

Ram (No.)	Breed	Age	Date of importation	Ave. vol. of semen per ejaculate in cc.	Ave. motility	Ave. No. sperm per cmm. in thousands	Ave. pH	Ave. % abnormal	Ave. % live sperm
97	Corriedale		Nov. 1940	1.29	5.0	3,100	7.00	2.2	86.6
406	Corriedale	4	Nov. 1940	0.64	5.0	3,828	6.89	2.2	88.8
358	Corriedale	5	Nov. 1940	0.80	5.0	1,780	7.25	2.1	89.8
No tag	Corriedale	4	Nov. 1940	0.98	5.0	3,600	7.10	3.6	83.0
287	Corriedale	1½	Mar. 1942	0.58	5.0	3,590	7.18	2.0	85.7
0C3	Corriedale	1½	Mar. 1942	0.20	5.0	2,045	7.20	7.3	82.2
320	Merino		Mar. 1941	0.86	5.0	3,895	7.09	2.2	89.2
317	Merino		Mar. 1941	0.78	5.0	4,000	7.02	2.7	88.7
312	Merino		Mar. 1941	0.52	5.0	3,190	7.12	2.3	84.0
314	Merino		Mar. 1941	0.76	5.0	4,380	6.97	2.9	78.9
309	Merino		Mar. 1941	0.70	5.0	3,970	7.08	14.5	86.4
No tag	Merino	3	Mar. 1941	0.90	5.0	4,380	7.10	6.0	
30	Merino	3	Mar. 1941	1.50	5.0	5,600	6.90	3.9	77.4
90	Merino	5	Mar. 1941	1.20	5.0	3,380	7.10	7.2	
No tag	Karakul			0.60	5.0	2,980	7.26	9.5	87.4
32	Karakul			1.10	5.0	4,220	6.98	3.0	91.6
Total No. samples				313	313	45	45	38	33
Average				0.83	5.0	3,540	7.06	3.1	85.6
330	Corriedale	5	Nov. 1940	0.62	2.7	1,284	7.80	44.7	57.7
19	Corriedale	4	Nov. 1940	0.97	1.2	1,534	7.87	84.0	20.8
405	Corriedale	4	Nov. 1940	1.23	1.7	1,356	7.92	43.9	14.4
185	Corriedale		Nov. 1940	0.90	2.0	2,780	7.40	40.0	9.0
301	Merino	3	Mar. 1941	0.48	1.5	1,567	7.89	52.4	14.5
321	Merino	5	Mar. 1941	0.85	2.3	1,690	7.74	24.0	34.1
360	Corriedale	5	Nov. 1941	0.83	4.7	2,410	7.55	3.3	62.6
31	Karakul			0.40	4.0	640	8.10	8.4	72.8

of which was only 18 months of age. Due to the war, this work was not followed through. The only lambing records obtained, those reported by a few of the ranch operators, showed that 39 per cent of the inseminated ewes dropped lambs from that breeding. One ranch on which the ewes received some supplemental feeding and fairly good management reported that 48 per cent of the inseminated ewes dropped lambs.

Rams

Percentages of infertile rams as high as 65 per cent have been reported in the Sierra. It is generally believed that the altitude is the cause for this drastic effect on ram fertility; however, there is no direct conclusive evidence to substantiate this belief.

In the work reported here, all pH readings were made with a Coleman glass electrode pH meter, usually within two minutes after semen collection and always within five minutes. The number of sperm per cubic millimeter was determined by the standard method using the hemacytometer and blood-counting pipette. Percentages of abnormal sperm were determined by counting 333 sperm from a smear and tabulating the abnormal ones. To determine the percentage of live sperm, 500 were counted from a smear and the number of unstained sperm tabulated.

Of the 24 rams studied (table 1), 16 produced semen which was normal in all respects, 6 produced semen of a poor quality which was abnormal in all respects, and 2 produced semen which might be classified as questionable, for it appeared normal in some respects and abnormal in others.

Of the 9 Corriedale rams imported in 1940, only 4 (44%) produced semen normal in all respects; of the 10 Merinos imported in 1941, 8 (80%) produced normal semen; and each of the 2 Corriedales imported in 1942 produced normal semen.

All of the abnormal semen studied showed the same characteristics. The color varied from one collection to another, sometimes being normal and other times being watery or brownish. Sperm concentration varied widely with each ram but was usually low. Motility and percentage of live sperm were always low. Consistently, a high pH and high abnormal sperm count was recorded. Practically all of the abnormal sperm were tailless or had coiled or broken tails. Many of the samples contained a high percentage of foreign cells. This uniformity of all the abnormal semen suggests that the same cause or causes producing this condition must have existed in each of the donor rams.

To obtain some indication as to the value of better nutrition in improving the quality of semen, 4 rams producing abnormal semen were placed on a supplementary ration consisting of a daily allowance per ram of about 1 lb. of alfalfa hay, 1 lb. of a mixture of oats, barley, and bran, ½ oz. of salt, and ½ oz. of a mineral mixture. The mineral mixture consisted of 3½ lb. of bone meal; 3½ lb. of salt; 2 lb. of lime; ½ lb. of sulfur; ½ lb. of ferric sulfate; 2 Gm. of iodine; and 3 lb. of dicalcium phosphate.

The feeding of this supplementary ration was started June 18, and continued until July 14. Studies were made of two ejaculates collected daily from each of the rams for two or three consecutive days of each week. During the latter part of this period, there was a general improvement in the semen quality of 3 of the 4 rams, shown by an increased volume per ejaculate, improved motility, a lowered percentage of abnormal sperm, and a higher percentage of live sperm. Since this experiment was conducted near the end of the breeding season, a slight decline in semen production and quality due to seasonal variation might normally have been expected.

It is realized that no definite conclusions can be drawn from such an experiment conducted over this short period and with this small number of animals, yet it may indicate the possible value of better nutrition for improving the fertility of rams in the Sierra and be of some help in setting up a more conclusive experiment.

Ewes

Along with the artificial insemination work, a daily record was kept of the number of ewes in heat at each ranch and the number of ewes in each flock from which the ewes showing estrus were selected. These records include a total of 10,771 ewes on 27 different ranches. The average percentage per day of ewes in heat was 6.45. At this rate, all of the ewes in a flock would exhibit estrus in 16 days, which is the normal estrous cycle of the ewe. Of the 6,751 ewes on 15 different ranches

checked during some part of May, the average daily percentage of ewes in heat was 7.76 compared with a percentage of 4.52 of 4,020 ewes from 15 different ranches for June. This percentage for May is higher than would normally be expected. Possibly, it is the result of lack of knowledge and carelessness of the ranch operators in selecting the ewes, but there is no reason why this same possible error did not exist during June, thus making the two figures comparable. The difference then in the percentage figures for May and June might be attributed to either of two factors, or both: (1) seasonal variation, and (2) the better condition of pastures during May. The pastures become very dry by the first of June.

The fall breeding season for many of the ranches in this area is during June and July. If the above figures give a true picture of conditions, then the season in which the ewes are bred may be one cause of the small lamb crop. Workers in other parts of the world have found that the estrous cycle of ewes is more regular and the conception rate is higher in the early part of the natural breeding season.

SEMEN STUDIES

In the practical application of artificial insemination, semen storage becomes an important problem which has been partially solved by the use of better semen diluters and improved methods of cooling. Phillip's yolk-phosphate diluter has probably given the best results for ram semen to be stored, although some workers have reported good results in the storage of undiluted ram semen. The studies reported here show the value of this diluter for the satisfactory storage of semen taken from rams at this altitude.

TABLE 2—Motility Readings of Samples of Semen Diluted with Yolk-Phosphate Diluter and Stored for Various Periods

Storage time (hr.)	12-24	36-48	54-84
Samples (No.)	14	37	21
Average motility	5.0	4.8	3.7

To determine the motility of the samples of stored semen, a small drop was taken from the sample and warmed to about 35 C. The hanging drop method was used. The percentage of live sperm was determined by counting 500 sperm on each of two opal blue-eosin stained smears and recording the percentage unstained.

Good results were consistently obtained with the use of the yolk-phosphate diluter (table 2). The semen used for this study was the unused portion of the samples stored for artificial insemination throughout the entire season.

Undiluted semen could not be stored satisfactorily. Results of undiluted semen stored for twenty-four hours showed a maximum motility reading of 3, but usually 1 and sometimes 0.

To determine the optimum rate for cooling diluted semen and to further demonstrate the value of the yolk-phosphate diluter at this altitude, the following experiment was conducted: From a sample of freshly ejaculated normal ram semen, four 0.2-cc. samples were taken and placed in small glass vials. The remaining portion was then diluted 1:4 with the yolk-phosphate diluter, and four 0.2-cc. samples of this placed in similar vials. The eight vials containing the samples were then corked and sealed with paraffin and divided into four groups with a sample of diluted and undiluted semen in each. All samples were then placed in a water bath at 20 C. After ten minutes, the samples of group 1 were transferred to a water bath at 15 C., ten minutes later to a bath of 10 C., and ten minutes after this to a water bath at 5 C. where they remained for another ten minutes, and were then stored in an ice water bath. The samples of groups 2, 3, and 4 were handled similarly except the time interval between changes were 20, 40, and 60 minutes, respectively. This cooling began about thirty minutes after collection. Opal blue-eosin smears were made of the diluted and undiluted semen before cooling and of each sample after twenty-four hours, five days, and ten days storage. Motility readings were made also at the same time. Two trials demonstrated the value of the yolk-phosphate diluter from the standpoint of motility and percentage of live sperm. After 24-hours' storage of the undiluted semen, there was a gradual increase in the percentage of live sperm from 24.0 in group 1 to 79.4 in group 4; while in the diluted semen, the maximum percentage, 82.4, was reached in group 2, reducing the time required for cooling to eighty minutes, or one-third that of the undiluted semen.

SUMMARY AND CONCLUSIONS

1) A brief report is given of the ovine artificial insemination project conducted in the state of Puno in the highland pastures of the Andes. During May and June, 1942, 4,300 ewes were bred to 7 rams; 3,628 ewes of this number were bred to 4 of the best rams. Lambing records on a few of these ewes indicated a 39 per cent conception rate from the one service.

2) Of 24 imported, registered rams, 67 per cent produced semen normal in every respect. The abnormal semen produced by 33 per cent was characterized by: (1) low motility, concentration count, and percentage of live sperm; (2) usually an abnormal color and containing foreign cells; (3) high pH and percentage of abnormal sperm which were always tailless, or had broken and coiled tails.

3) Four of the rams producing abnormal semen were fed a supplement ration for about a month and there was an improvement in the quality of semen produced by 3 of them.

4) The average daily percentage of ewes showing estrus was 6.45 for May and June; taken separately, this percentage was 7.76 and 4.52, respectively:

5) Samples of ram semen diluted with Phillip's yolk-phosphate diluter were stored satisfactorily while undiluted semen could not be stored.

6) Results from two trials show that the addition of yolk-phosphate diluter to ram semen reduces by 67 per cent the time required for cooling to 0 C.

Abnormal Spermatozoa of Bull Semen

Many workers have examined innumerable samples of semen, but no widespread classification of the types of abnormal spermatozoa or their varying incidence has been published. D. H. L. Rollinson *(Brit. Vet. J.*, May, 1951), by means of a survey, provides a more elaborate classification to further improve diagnosis of infertility. In the study of spermatozoal deviation from the normal, much contradictory evidence exists.

The laboratory was notified by the attending veterinarian of cases in which bulls were suspected of being the main cause of unsatisfactory breeding histories. In every case the bull was examined by the author at the farm on one or more occasions, so that details were obtained of all factors associated with the infertility. Assessment of records in the field and accurate evaluation of the fertilizing capacity of semen present great difficulty.

In the present study, herds were assessed as a whole, and fertility rates calculated on a percentage basis. This enables the inclusion of interesting cases from herds having very poor records, since it is always possible to obtain the number of cows in, and not in, calf.

The greater proportion of bulls examined were young, 37.93 per cent being under 2 years old, 55.17 per cent under 3 years, and 72.42 per cent under 4 years of age. Sixty-three per cent of the first group and 60 per cent of the second were sterile.

In considering the prediction of fertilizing capacity of semen, it has become accepted by many workers that the larger the number of tests performed, the more likely is accuracy to be achieved. Several workers have noted the presence of variously described tissue cells in semen.

Certainly most work on abnormal sperm has been performed on fixed stained cells, and the varying methods employed may have affected the results obtained. The writer believes that by estimating the abnormalities in the fresh state on the hemocytometer (*i.e.*, the approximate percentage and predominating type), then scoring on a carefully prepared smear and, if necessary, checking by examination of blood smears, an accurate estimate can be made.

Variations in spermatozoa may take many forms, and very little agreement about the relative incidence of types is apparent. Generally speaking, spermatozoa vary from the normal (1) in respect of their staining capacity, (2) in their size, and (3) in shape.

Middle-piece abnormalities include enlarged (swollen), filiform, beaded, shrunken, bent, duplicated middle pieces or abaxial attachment to the head. Also, protoplasmic drops may be associated with the middle piece. Their presence in semen is taken to denote immaturity of the sperm. Abnormalities of the tail are fewer in number, consisting principally of bends and coils.

Subdivisions employed in this case were simple and straightforward, the primary division being that of "headed" and "headless" tails. The latter divisions were subdivided into "double," "coiled," "bent," "kinked," and "tufted" tails.

Fertility of Diluted Bull Semen Increased with Antibiotics

Recent research has shown that fertility increased when certain antibiotics were added to diluted semen.

It is generally accepted that accurate prediction of the probable fertilizing capacity of any given semen ejaculate is not possible. Therefore, the authors believe that all diluted semen should be given the advantage of an added antibiotic except when such ejaculates originate from a bull whose semen consistently responds negatively to such treatment. Under the conditions of this study, it appeared that streptomycin alone was equal to a combination of streptomycin and penicillin for increasing the fertility of diluted bull semen in a yolk-citrate-sulfanilamide diluent. This finding indicated that penicillin could be omitted, thereby reducing both labor and expense in artificial breeding.—*North Am. Vet., June, 1951.*

Starch Sponge—A New Hemostatic Agent

Hemorrhage is at present acknowledged to be the leading cause of death in obstetrics.

In 1947, a patent, granted to Drs. Bice and MacMasters, was assigned by them to the U. S. Department of Agriculture for an absorbable starch sponge which could be utilized both as a food and a surgical dressing. After reading a description of this patent it seemed to the author, because of the chemical and physical composition of the substance, that not only would it be useful for the purposes they had in mind, but that it would also act as a hemostatic agent.

The dry sponge is capable of absorbing 16 times its weight in water. It can absorb appreciable amounts of medicaments such as penicillin, streptomycin, gramicidin, and sulfonamides. The idea of the patentees was to incorporate medicinal substances into the sponge and introduce them into deep or surface wounds where they could be left until absorbed. The sponge disintegrates slowly in body fluids and the dissolved material after enzymatic attack is absorbed by the tissues without harmful results.

The starch sponge was employed as a hemostatic agent in 155 cases. The starch was applied either in the form of a bar, a gauze-impregnated pack, or as a powder. Intraperitoneal, intrauterine, vaginal, perineal, rectal, fascial, and muscle applications were made.

In nearly every instance where oozing of blood resulted from capillary or venous injury, hemostasis was attained.

The action of the sponge is apparently local and augmented by the fact that less thrombin is required for the formation of clot.

The low cost of the starch sponge in comparison to other hemostatic agents such as gelfoam and oxycel is a real contribution in this era of high cost of medical care.—*Samuel S. Rosenfeld in Am. J. Obstet. and Gynecol., May, 1951.*

Liver Function in Normal and Toxemic Pregnancy

The liver has manifold functions, a tremendous reserve, and an unusual ability to regenerate. Abnormal liver function has been associated with preëclampsia for many years because the diagnosis of eclampsia has frequently been based entirely on the periportal hemorrhage which is supposedly pathognomonic of the condition.

There are innumerable tests for various functions of the liver and most of them, at one time or another, have been tried in pregnant and toxemic patients.

The thymol turbidity, cephalin flocculation, serum bilirubin, and urine bilirubin tests were determined in pregnant patients with preëclampsia or hypertensive disease, and in normal pregnant patients. The studies have been of no value in deciding about the diagnosis or prognosis of patients with preëclampsia or hypertensive disease in pregnancy. The cephalin flocculation test may possibly indicate in early pregnancy those patients who may develop preëclampsia in the last trimester of pregnancy. —*Liver Function Studies in Normal and Toxemic Pregnancy. Surg., Gynecol. and Obstet., May, 1951.*

The effectiveness of the cervix for semen deposition is equal to, or better than, the deep uterine area.—*North Am. Vet., June, 1951.*

CLINICAL DATA

Azoturia and the Crush Syndrome

Wm. E. RIBELIN, D.V.M.

Pullman, Washington

WORKERS IN HUMAN medicine since about the time of World War I have recognized a peculiar syndrome which appears following severe damage to blood or tissues.[1] Patients suffering injuries such as severe crushing of muscles, with no other damage, apparently improved for several days and then began showing signs of progressive oliguria which, despite administration of fluids, often progressed to renal failure with complete anuria. To this series of reactions was applied the term "crush syndrome."

The applicable clinical manifestations are described by Lucké[2] as follows, "The urine as is passed is generally highly acid in reaction, its specific gravity is low—in many cases the urine may be bloody or smoky for the first day or two. In practically all cases regardless of its color the urine gives a positive benzidine reaction indicating the presence of a heme pigment. This pigment is myohemoglobin when the causal condition involves massive destruction of muscle." The muscular changes are those of a fish-flesh appearance to actual necrosis. In all of these cases, the renal lesions consisted of degeneration of the distal segments of the tubules (lower nephron) with brown casts of some heme compound in the lower nephrons and collecting tubules. Accordingly, the term "lower nephron nephrosis" has been applied.[3]

The similarity of this syndrome to the renal aspects of azoturia in Equidae was investigated by the author and an attempt is made to compare the two conditions in this paper. Studies of renal changes associated with equine azoturia have been made by previous workers,[4] and the suggestion of their relationships was put forth by Gilmour[5] in his commentary on the crush syndrome.

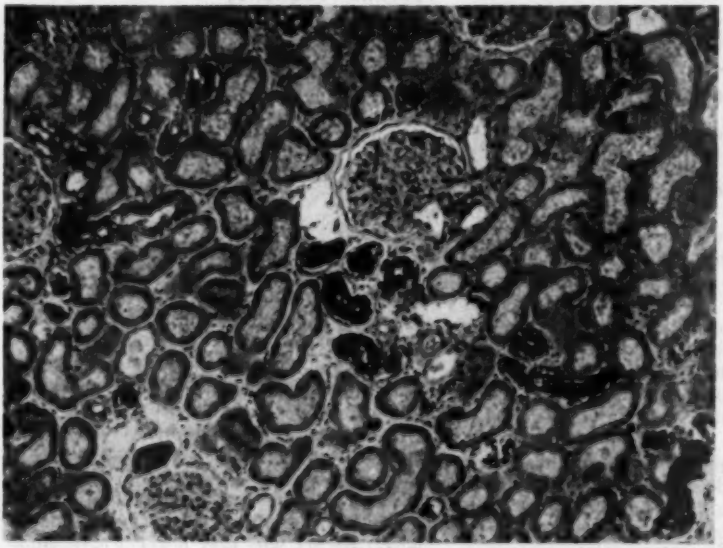

Fig. 1—Kidney lesions in a fatal human case of nephrosis following crush injury. Note hemoglobin pigment casts. x 130.

—*Armed Forces Institute of Pathology Ac. No.* 129334 (*Neg.* 86203)

Some of the major causative factors usually associated with this particular renal degeneration in man are severe muscle trauma, muscular ischemia, burns, transfusion with incompatible blood,

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heat stroke, black water fever, pregnancy toxemias, and utero-placental damage. There are probably many others. The purpose of this study was to determine whether equine azoturia was one of these others. The reader will note that these conditions are all characterized by massive destruction of blood or tissues. Because of the presence of heme pigments casts, the term "hemoglobinuric nephrosis" has also been applied.

The actual causes of the renal lesions of myoglobinurias and hemoglobinurias have been both studied and postulated by many workers. Among the contributing factors have been listed the toxic effects of various hemoglobin products formed in the renal tubules.[6,7,8,9] Also suggested is renal ischemia due to the effects of hemoglobin,[11] shock,[10] and possible reflex vasomotor actions.[12] The nephrotoxic effects of various abnormal muscle metabolites have been demonstrated.[13] The possibility of actual obstruction by precipitated heme pigments has also been demonstrated.

Lesions of the Crush Syndrome

Whatever the actual mechanism of renal damage may be, a strikingly consistent series of renal changes is produced. In persons dying several days following severe crushing injuries, the lesions are mostly confined to the kidneys. Grossly, the kidneys are swollen, heavy, and flaccid. The capsule strips easily, leaving a smooth, pale surface. Upon incision, the cut surface oozes clear or bloody fluid. The cortex appears moist and pale. The medulla is dusky with accentuated dark striations. There may be petechiae in the parenchyma and on the pelvic surface. The renal pelvis itself often contains bloody, dark brown urine.

Microscopically, the changes are mostly confined to the distal tubules. The glomeruli appear normal but often contain few red cells, thus suggesting poor circulation. The capsular spaces contain a homogeneous proteinous precipitate but are usually not particularly dilated. Sometimes, capillary hemorrhages are seen. The proximal convoluted tubules and Henle's loops are normal. If the case is over three or four days' duration, the terminal loops of Henle and the distal convoluted tubules exhibit marked degenerative changes to complete necrosis; before that, only granularity and fatty changes are seen. These lesions are focal, occurring especially near thin-walled veins. Rupture of these tubules is common, with resultant cytoplasmic and epithelial casts, or if into a vein, local thrombosis may occur. After the fifth day, the epithelial remnants of this degeneration begin to disappear and the regeneration of new epithelium may be seen to occur in the form of new flattened cells beneath the older more cuboidal epithelium. Casts of

Fig. 2.—Hyaline degeneration of skeletal muscle following azoturia. Note focal areas of pigment loss. x 180.

myoglobin or hemoglobin derivatives are seen in the ascending loop of Henle and in the distal tubules, but more commonly in the collecting tubules. Both types of pigment are copper-brown with hematoxylin and eosin stains and may be either smooth or granular. Extremely small pigment granules which resemble red blood cells are often seen but are much smaller. In addition to these heme-derived casts, another hyaline, eosinophilic, proteinous-type cast is also present. They are less common and generally occur only in the more severely damaged portions of the tubules.

The collecting tubules, by comparison, are reasonably normal. They may be stripped of epithelium in certain areas with evidences of regeneration and are the most common sites of the heme casts. The stroma of the kidney may be edematous and sometimes an inflammatory reaction is observed in the neighborhood of severely damaged tubules. The affected muscles in this condition have a characteristic pale "fish-flesh" appearance and may be actually necrotic. Microscopically, there are vari-

able stages of hyaline degeneration, fragmentation of fibers, and loss of staining affinity. Further and more complete descriptions of the crush syndrome may be obtained from the excellent articles by Lucké[2] and Moon.[14]

LESIONS OF AZOTURIA

A study was made of the tissues obtained from 8 cases of azoturia at the Washington State College veterinary clinic in an effort to compare the lesions of these cases with those of the crush sydrome. Those selected were cases having histories of at least forty-eight hours of inactivity followed by greatly increased muscular exertion. The features considered diagnostic were sudden onset of muscular stiffness progressing to almost complete paralysis, hardening or "knotting" of affected muscles, extreme pain, sweating, and passage of dark brown urine with later anuria. The duration of symptoms varied from twenty-four hours to four days. Tissues examined were those which had been fixed in 10 per cent formalin less than four hours after death.

Eight cases revealed irregular hyaline degeneration of various muscle bundles which at times became basophilic or lost staining affinity altogether. Affected fibers were wavy or tortuous and at times prominent fragmentation occurred. Fibers were separated irregularly. Many fibers were small, shrunken, and pulled away from their delicate endomysial investments. At times, these fibers exhibited a gouged-out appearance as though certain focal areas were completely devoid of pigment. Hyperplasia of skeletal muscle nuclei in affected areas was common. There was little or no loss of striations. Generally, the muscle was hyperemic but in only 1 individual was there evidence of true myositis. The general picture was one of focal myopathy. Often, the smaller arterioles adjacent to affected bundles exhibited variable degrees of fragmentation of the mediums accompanied by bizarre smooth muscle nuclei and variable disruption of the intima.

The kidneys of affected animals were moderately swollen, generally normal upon the external surface, with dirty brown cortices and deep red-brown streaking of the medulla. The following is a description

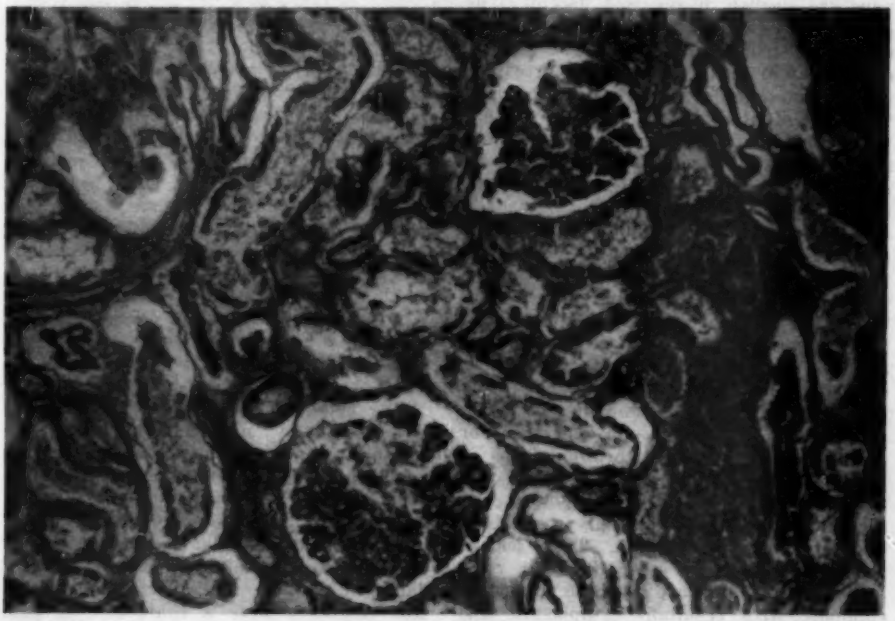

Fig. 3—Kidney changes in azoturia nephrosis. Note extensive necrosis of convoluted tubules and hemoglobin pigment (A) resembling sloughed cellular debris. x 160.

of the microscopic lesions. In half of the animals examined, there was an obvious increase in erythrocyte content of the vessels of the glomeruli; the other individuals showed, if anything, a decrease to total absence of glomerular circulation. There was a general impression of increased endothelial cellularity of the glomeruli and in 2 individuals the capsular spaces were completely obliterated. None showed capsular dilation. In 1 individual, a homogeneous, eosinophilic, protein-like material was seen in the capsular space, resembling very much the similarly described substance in man. The general appearance of the glomeruli was not markedly abnormal.

The proximal convoluted tubules in 6 of the 8 animals studied revealed marked degenerative changes beginning with cloudy swelling and often extending to complete necrosis, loss of cellular detail, and sloughing of segments of a cell or several cells into the lumens. In 2, an orange-brown granular material (hemotoxylin and eosin stain) resembling disintegrating erythrocytes was seen. In 1 case only was the epithelium normal.

The thin segments of Henle's loops were approximately the same as the proximal tubules in half of the animals; in the other half, there was an apparent increase in loss of epithelium. One was apparently normal, yet contained homogeneous eosinophilic casts. Another displayed many erythrocytes free within the lumens of its tubules. The thick segment of Henle's loops showed the same changes as the thin segments but with the appearance of pale amorphous orange-brown granular material in the lumen, presumably a heme pigment of some type.

Lesions of the distal tubules were, in general, more severe than those of the foregoing segments. There was a much greater loss of epithelium in all but 1 individual, that 1 being a case of short duration which had only cytoplasmic granularity. No casts were observed.

The collecting tubules exhibited the most extensive exfoliation of epithelium of all segments examined, but actual degenerative signs such as pyknotic nuclei, cytoplasmic changes, and rupture of the cell membranes, were not as common as higher up in the nephron. In 3 animals, there were accumulations of amorphous, eosinophilic material in their lumen resembling the remnants of sloughed cellular material. Three more contained remnants of red blood cells. Small, rounded, brownish casts resembling erythrocytes, but much smaller (1.4 to 2μ) and having irregularly crenated-appearing edges and dimpled centers, were seen in 2 individuals. These resembled very closely the small heme-derived pigment casts seen in man. In 1 animal, the loss of epithelium extended well down into the papillary ducts and in 2 others, a deposit of rounded, finely-granular, purplish material resembling extremely fine calcification was deposited in cuffs or dense layers along the basement membranes of the epithelium of the papillary ducts.

The renal stroma was generally normal; edema was present but not marked. Periarteriolar fibrosis was noticed in three of the kidneys and was accompanied by degenerative and fragmentive changes in the mediums. Apparently, only the larger vessels of the cortico-medullary boundary zones were so affected. The over-all appearance of the renal lesions was one of disseminated, vaguely focal involvement of all portions of the nephrons except the glomeruli, in the affected areas, and little specificity was shown toward any particular functional portion of the nephron.

COMPARISONS OF LESIONS

In comparison, there was a striking similarity between the muscular lesions of persons exhibiting lower nephron nephrosis and those of the horse affected with azoturia. The similarities in renal lesions were also seen but were not quite so obvious. The "lower nephron" portion of the description was not applicable to the horse, since the lesions in that animal seem more applied to indefinitely focal areas of the kidney rather than to certain functional portions of the nephron as occurs with the crush syndrome in man.

It is of interest to note that man is also subject to an azoturia-like condition, commonly referred to in human literature as paralytic myoglobinuria. To this date, only 8 cases have been reported.[3] The condition is apparently brought on by increased muscular exertion following periods of rest and both the clinical and pathological manifestations are practically identical to the condition familar to veterinarians as azoturia. The similarities are so apparent as to ob-

viate a comparison of them in the present paper.

SUMMARY

The similarities of muscular and renal lesions of the crush syndrome in man and those of azoturia in the horse are described. Brief mention is made of the rare azoturia-like condition, paralytic myoglobinuria, which occurs in man.

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Control of Sheep Ticks

Good control of sheep ticks can be obtained by spraying or dipping. Sprays of DDT or derris powder must be applied with power equipment having at least 400 pounds of pressure in order to penetrate the wool.

The easiest way to spray sheep is to confine them, a few at a time, in a small pen so that the spray nozzle can be held a few inches from the fleece. DDT should be used at the rate of 8 lb. of a 50 per cent wettable powder in 100 gal. of water, whereas the mixture for derris powder is 1 lb. of 5 per cent material in 100 gal. of water.

The sheep tick is a remarkable insect. It is not a tick but a wingless fly. It also gives birth to living young whereas most insects lay eggs. The young "ticks", which are really a type of maggot, are nearly full grown when born. They are fastened securely to the wool fibers, where they live for only a few hours before changing into brown seedlike capsules. These capsules are pupal cases in which the maggots change into mature ticks. One sheep tick will live nearly six months and give birth to about 15 young.—*Purdue University, Lafayette, Ind.*

Swine Erysipelas

Duration of immunity expected after the vaccination of pigs with erysipelas culture and serum is limited. It is dependable for approximately four months only. In consideration of this factor, it may be appreciated why costly losses due to erysipelas infection occur shortly before marketing age and weight in vaccinated hogs which are thought to be immune. On farms where erysipelas has occurred in previous years and where it may be desirable to protect growing animals, vaccination is done approximately three weeks after serum-virus immunization for hog cholera. On this schedule, immunity to erysipelas is more likely to protect animals during the growing and fattening periods.—*W. A. Aitken, D.V.M., Merrill, Iowa, at the Annual Convention of the Indiana Veterinary Medical Association, Indianapolis, Jan. 10-12, 1951.*

Cortisone in Diseases of the Eye

Cortisone has been used in the treatment of a variety of eye conditions (143 cases in all), mostly administered by subconjunctival injection or in drops. Interstitial keratitis was particularly benefited, and iridocyclitis also improved rapidly in most cases. Treatment of 2 cases of sympathetic ophthalmia with systematic cortisone was successful. It is concluded that cortisone is very valuable in the control of allergic reactions in the eye, but has no effect on any underlying disease which may be the basic condition.—*Brit. M. J., June 9, 1951.*

Evaluation of Distemper Vaccinations

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New Haven, Connecticut

THIS ARTICLE is a continuation of the paper published in the JOURNAL (July, 1947: 48-49) describing the comparative efficacy of Green and Laidlaw-Dunkin distemper vaccinations. There still exists confusion concerning the most reliable method of vaccinating dogs against distemper, and the data presented here were compiled in an endeavor to stimulate additional investigation in this field.

The present series of records covers 389 dogs, all vaccinated by the Green method since July, 1947, and the results are compared with the Green vaccination figures published three years ago. No new records are given on Laidlaw-Dunkin vaccinations, using two vaccines and one virus, and other methods of vaccination.

METHODS OF DISTEMPER VACCINATION

Methods of vaccinating dogs against distemper can be divided into four main groups:

1) Distemper antiserum, widely used to produce a passive immunity for two to four weeks, for prophylaxis, and also for its benefit in the treatment of distemper during the early stage of virusemia.

2) The Laidlaw-Dunkin method, as originated in England, using one subcutaneous injection of vaccine followed two weeks later by an intradermal injection of live virus. Due to the severe reactions (or breaks) in this country, procedure was later modified by giving two injections of vaccine, two weeks apart, followed two weeks later by intradermal injection of virus. The published records of 224 dogs vaccinated with the Laidlaw-Dunkin method (table 1) show a 7.14 per cent mortality, which does not speak too favorably for its use.

About fifteen years ago, Dr. Geo. Watson Little originated a new type of vaccination using subcutaneous injection of concentrated serum followed simutaneously by injection of live virus. This method was completely discarded after a few years because of bad results.

3) Injection of vaccine with or without addition of bacterins from organisms such as *Brucella bronchisepticus, Streptococcus canisepticus, Salmonella typhimurium*, etc. This method is widely accepted, but practitioners differ concerning the method of its use. Virogen literature states that it should be administered subcutaneously or intramuscularly, in three successive 5-cc. doses, at two to three weeks intervals, starting when the dog is over three months old. But they also add that "where conditions permit, longer intervals may be preferable." The practitioner, who has no possibility of scientific experimentation, is thus left to his own discretion in spacing shots. Some veterinarians initiate virogen distemper prophylaxis before puppies are three months old, and give booster injections six months to a year following the last routine injection. This situation is ample proof that no standardization has been achieved, and leaves some doubt concerning the efficacy of any of the vaccines for active immunization as a routine procedure.

4) The method of injecting distemperoid virus of ferret origin, such as the "Green" product, has provoked more polemics than any other method. While the majority of small animal practitioners seem to favor the use of several injections of vaccine, with more or less good results, other practitioners are diametrically op-

TABLE 1 — Comparison of Laidlaw-Dunkin and Green Vaccination (1947)

		Total breaks		Survived		Died from distemper		Died from encephalitis		Total deaths	
Method	Dogs (No.)	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
Laidlaw-Dunkin	224	22	9.82	6	2.67	14	6.25	2	0.89	16	7.14
Green	380	19	6.33	4	1.33	None		15	5.00	15	5.00

From the New Haven Small Animal Hospital, New Haven, Conn.

posed to this method. Some believe that immunization with distemperoid virus is the best method both theoretically and practically, while others have no good word for it. But even those practitioners who use distemperoid virus do not follow a uniform method. Some would use only one injection of Green, while others would use another dose several weeks or even months later. Believers in Green's cell-blocking theory would even use the distemperoid virus in the first stages of distemper in the opinion that the injected nonpathogenic distemperoid virus will enter the normal cells and block the entrance of the disease-producing virus.

Table 1 compares Laidlaw-Dunkin and Green vaccinations as published in July, 1947, while table 2 compares the Green vaccinations from 1947 to 1950 with those of previous years.

Most of the 389 puppies innoculated with Green vaccine (table 2) were over 12 weeks of age, and it was endeavored to vaccinate them when they were free of worms or immediately following the administration of anthelmintics. Younger puppies were injected with homologous serum, properly wormed, and followed one month later with one injection of Green vaccine. In this group, there were 14 "breaks" of which 8 puppies survived following a severe reaction, and 6 died, a mortality of 1.54 per cent. Of the 6 deaths, 2 were due to distemper and 4 to encephalitis. Of the 14 breaks (table 2), 8 were males and 6 were females; half of them occurred within three months of vaccination. Of the 6 deaths, 2 occurred one month after vaccination, 3 during the first year, and 1 two years later. Of the 389 dogs, 206 were males and 183 females. Most of the female dogs were vaccinated on the same day, or one day following oöphorectomy, and taking into consideration the fact that there were 8 breaks among 206 males and 6 breaks among 183 females, it may be concluded that it is not detrimental for females to be spayed and vaccinated with Green at the same time. This is further borne out by the fact that of the 6 deaths, 3 were males and 3 females.

The reduction in the total mortality from 5 per cent to 1.54 per cent and reduction in encephalitis mortality from 5 per cent to 1.03 per cent (table 2) seems to indicate an improved laboratory technique in the manufacture of Green vaccine. However, it must be remembered that virulence of distemper outbreaks, especially of the neurotropic type, varies from year to year and must be considered a factor in these figures.

TABLE 2 — Comparison of Green Vaccinations from 1947 to 1950 with Those of Previous Years

Method	Dogs (No.)	Total breaks (No.)	Total breaks (%)	Survived (No.)	Survived (%)	Died from distemper (No.)	Died from distemper (%)	Died from encephalitis (No.)	Died from encephalitis (%)	Total deaths (No.)	Total deaths (%)
Green (table 1)	300	19	6.33	4	1.33	None		15	5.00	15	5.00
Green (1947-50)	389	14	3.59	8	2.06	2	0.51	4	1.03	6	1.54

Recently, avianized canine distemper virus has been introduced. This is a live distemper virus which, being of avian origin, is supposed to lose its pathogenicity and give lasting immunity against distemper. While laboratory recommendations give three to four months as the ideal age for immunization, they also claim that this product can be given to healthy, 6-week-old pups, followed with a booster second injection of virus when they are 4 to 6 months old. No objective data is available on this method at this time and its efficacy can not be evaluated.

CONCLUSION

Although forward steps have been made in vaccinating dogs against distemper, there is still no uniform method generally accepted by practitioners, and veterinarians still have to rely upon their own judgment and the recommendation of the various laboratories who are out to push their own particular product. Inasmuch as the prevention of distemper is of primary importance to the dog owner, and to the veterinarian who derives a fair share of his income from vaccinations, it is of paramount importance that a central clearing house should be established where veterinarians could send their records of vaccinations, stating age, sex, methods and products used, number of breaks, and other per-

tinent information. A research fellow assigned to this problem would have at his disposal statistics on many thousands of dogs and would be enabled to compute figures according to geographic areas and other categories. It would also be worth while to compute statistics on the incidence of distemper and encephalitis in dogs which have had no prophylaxis treatment whatever, and compare these figures with those of vaccinated dogs. Such a research project would be of tremendous importance in determining a standardized procedure for routine vaccination against distemper, and should receive the support of all veterinarians.

Coagulation in Seeping Hemorrhage —Evaluation of Koagamin,® New to the Veterinary Field

EDWIN R. BLAMEY, M.R.C.V.S.

New York City, New York

In the field of veterinary medicine and surgery, there are many instances in which the practitioner frequently has need of a reliable coagulant to help regulate hemorrhage from terminal blood vessels. This is especially true where there is internal bleeding which may first manifest itself in hematemesis and/or in bloody stools. Steps must be taken quickly if one is to save the animal.

In my work with small animals, I commonly encounter a condition which confronts veterinarians during the winter months when householders and street-cleaning departments employ chemicals to facilitate the removal of ice and snow. These chemicals cause the animal's paws to smart and his natural inclination is to lick the irritated extremities. In so doing, he may swallow the chemical.

Under these conditions, dogs are brought in for treatment with symptoms of gastrointestinal irritation characterized by vomiting and diarrhea. The vomitus may include food, then mucus, and finally blood-stained mucus. Soon after vomiting starts, there is an accompanying diarrhea. The stool changes rapidly in character and soon consists of mucus with blood-stained patches. If unchecked, the hemorrhage becomes more and more prolific. The patient demonstrates marked anemia and desiccation; symptoms of shock develop. Death often occurs before the patient is brought in for medical attention. In the early stages, there may be a slight elevation in temperature to 102.0 to 102.5 F. In the severe and neglected cases, the temperature drops to about 100 F.

The gastric disturbance may be controlled, to some extent, by the use of standard procedures but if hematemesis develops, I have found that the oral administration of drugs is of little avail. The same may be said of the dysentery.

In searching for some method, preferably parenteral, of checking the bleeding found in this condition, my attention was called to a preparation which, over the past decade has enjoyed considerable success in the field of human medicine.[1-4] This preparation (koagamin®)* is a sterile, aqueous solution of oxalic and malonic acids. Since it has been used in man preoperatively and postoperatively and to check abnormal, venous, and capillary bleeding, we felt quite sure that a similar beneficial effect would occur in animals. The use of this preparation was completely justified by the excellent results obtained.

The preparation may be administered either intravenously or intramuscularly. It is nontoxic when used in the correct dosage and, if necessary, repeated injections may be given. It is protein-free and does not cause anaphylaxis; it contains neither alkaloids nor narcotics and, in my experience, it may be used at the same time as any prescribed oral treatment.

Since, in most cases, rapid action is desirable, this can be ideally obtained by intravenous administration. The average dose for a dog up to 25 lb. is 2 cc., immediately upon admission, and this may be followed by injections of 2 cc. intramuscularly at two-hour intervals, if the hemorrhage continues. The dose should be scaled to the weight of the patient, but 1 cc. in toy dogs and 4 cc. in large breeds may be considered safe.

My respect for this preparation is such that I now use it routinely in every case of hemorrhage, or in all cases requiring major or minor surgery.

For example, it has a definite place in

Dr. Blamey is a small animal practitioner in New York City.

*Koagamin is manufactured by Chatham Pharmaceuticals, Inc., Newark, N.J.

controlling hemorrhage where mouth infections necessitate multiple dental extractions in old dogs. Two cubic centimeters given intravenously, preoperatively, will help to control, if not prevent, hemorrhage. If bleeding continues for some time after extraction, the patient may be given a second or third dose, intramuscularly.

The solution has been used in several cases of postpartum hemorrhage. When the bleeding is prolonged beyond a normal period of twenty-four to forty-eight hours, or if there is an abnormal bloody discharge immediately after whelping, the preparation is administered intravenously or intramuscularly, either by itself or with a solution of posterior pituitary extract. In cases of cystic hemorrhage caused by mechanical irritation due to calculi, there has been marked relief. It has a beneficial place in the control of seeping hemorrhage in certain surgical procedures.

I have employed the preparation in so many types of cases that to review them all here would be onerous. Plastic operations, enucleations of the eye, excision of Harder's gland, all abdominal operations, including hysterectomies of cats, would be included.

CASE HISTORIES

Case 1, Crossbred Terrier Type.—This animal, brought to me in poor condition, vomiting blood, and with bloody stools, received an intravenous dose of 2 cc. of koagamin, followed immediately by an intramuscular injection of 2 cc. Intramuscular administration was repeated in two hours and again in four hours. Oral medication consisted of frequent dosages of albumen (egg white), bismuth subcarbonate, and ten drops of brandy. The patient was kept quiet. Ice was given in place of water. The diarrhea and vomiting were under control and the hemorrhage stopped in about three hours.

Case 2, Cocker Spaniel.—This animal had a sudden attack of gastrointestinal disturbance, characterized by frequent vomiting and by passage of many stools consisting largely of mucus and blood. The dog was given 2 cc. of the solution intravenously and 2 cc. into the muscle of the thigh. The intramuscular injection was repeated in two hours. All signs of hemorrhage ceased before the second dose, but this was given to make certain that hemorrhaging had ceased. The dog was discharged in excellent condition.

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Leukosis Not Transmitted Through Eggs

In their experiments with chicken strains highly susceptible to leukosis, the authors demonstrate that mortality in chicks hatched from eggs of such susceptible strains was practically nil when they were raised in isolation.

Chicks raised on clean premises were of a strain so highly susceptible that in those exposed to natural infection deaths from leukosis exceeded 58 per cent. Among 280 pullets raised in isolation, only 1 bird developed the disease during 160-day observation periods in experiments extending over two years. This in spite of the fact that they were held in the hatching compartments for eighteen to twenty hours beyond the hatching period. If the virus causing leukosis were transmitted from hen to chick through the egg, or if any chicks were infected in the incubator, there should have been serious losses, whether or not exposed to the disease at a later date.

Development of further resistant strains and isolation offer the poultryman a practical method of control. The evidence in this work offers no support for the theories of disease transmission through the egg or dissemination in the incubator.—*Poult. Sci., March, 1951.*

It appears that infectious atrophic rhinitis is caused by a combination of two separate agents that attack while the animals are still young. The condition seen in adult swine is the aftermath of an infectious process that developed several months earlier.—*1950 Rep., Director of Science Service (Canada).*

The Lethal Effect of Benzene Hexachloride and the Delta Isomer on Swine Kidney Worm Larvae

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THE DAMAGE caused by the swine kidney worm, *Stephanurus dentatus* (Diesing, 1839) has created an important economic problem for swine raisers in the southern states. The mature kidney worms, about 2 in. long and $\frac{1}{16}$ in. in diameter, are found in the kidneys and in thick fibrous tissue cysts in the perirenal fat.

The annual economic loss caused by this parasite has been estimated at $3,000,000 to $5,000,000. These losses are due to inefficient utilization of feed and to portions of carcasses, including livers, kidneys, and loin, not suitable for food.

The usual method of infection is by mouth; however, under certain conditions, the larvae can penetrate the skin. The larval kidney worm in its passage through the body may locate in the liver, kidney, loin, and perirenal fat. The damage produced in these tissues makes them inedible.

The principal injury occurs in the liver and, if extensive, this organ can not function properly, food is imperfectly utilized, and the pig is unthrifty.

EXPERIMENTAL

To determine the effect of kidney worm larvae upon the daily gain of swine, 8 weaned pigs were divided into two groups of 4 pigs each (table 1). Group 1 was a control group which did not receive kidney worm larvae. In the second group, 2 pigs each were given 200 larvae *per os*, and 2 pigs each were given 1,000 larvae *per os*.

Averaging the slaughter weights and daily gains of the two groups of pigs in this experiment showed that the pigs in group 2, averaging 170 lb. and gaining at the rate of 1.09 lb. per day, would take an additional fifty-nine days to weight 235 lb. (as in group 1, table 1). If these pigs received approximately 6 lb. of grain ration per day at 4 cents per pound, it would cost an additional $14.16 for these animals to attain a weight of 235 lb.

LARVICIDE STUDIES

The development of many new insecticides prompted the effort to find a compound which would be relatively harmless to the newborn pig and yet destroy the kidney worm larva before it becomes infective.

TABLE 1—A Comparison Between Control Swine and Those Infected per os with Kidney Worm Larvae

Pig (No.)	Weaning weight (lb.)	Slaughter weight (lb.)	Larvae given at weaning (No.)	Daily gain (lb.)	Approx. age at slaughter	Condition of liver
			Group 1			
1	32.0	246	0	1.63	6 mo.	Edible
2	37.25	240	0	1.62	6 mo.	Edible
3	31.00	231	0	1.55	6 mo.	Edible
4	28.00	224	0	1.50	6 mo.	Edible
Ave.	32.06	235		1.57		
			Group 2			
5	34.0	187	200	1.17	6 mo.	Not edible
6	34.75	180	200	1.16	6 mo.	Not edible
7	33.00	160	1,000	1.02	6 mo.	Not edible
8	28.75	155	1,000	1.01	6 mo.	Not edible
Ave.	32.62	170		1.09		

The commercial insecticides tested were DDT, marlate, chlordan, toxaphene, rhothane, parathion, TEPP, DD, sabadilla, ryania, benzene hexachloride, and the *alpha*, *beta*, *gamma*, *delta*, and *epsilon* isomers of benzene hexachloride.

In controlled tests *in vitro*, 1,000 kidney worm larvae were exposed to 100 mg. of each compound in 5 cc. of water. The kidney worm eggs were hatched in an animal-charcoal water medium. The larvae were collected with the Baermann apparatus.

Benzene hexachloride (6%) was the only compound which in twenty-four hours destroyed 99 to 100 per cent of 18- to 20-hour-old swine kidney worm larvae. In the

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Associate animal pathologist (Anderson); animal husbandman (Godbey); and extension livestock specialist (DuRant) at the South Carolina Experiment Station.

The authors are indebted to: Commercial Solvents Corporation, Terre Haute, Ind.; Dow Chemical Company, Midland, Mich.; E. I. DuPont de Nemours & Company, Wilmington, Del.; Niagara Chemical Division, Middleport, N. Y.; and Pennsylvania Salt Manufacturing Company, Philadelphia, Pa., for the delta isomer used in the experiments.

control group, approximately 70 per cent of the larvae were alive after fourteen days.

The *in vitro* tests revealed that the *delta* and *epsilon* isomers of benzene hexachloride possess larvicidal properties.

The *delta* and *epsilon* isomers and benzene hexachloride did not inhibit the embryonation or hatch of kidney worm eggs. The larvae were destroyed about nine to twelve hours after hatching.

Animal toxicity studies were conducted with the *delta* isomer (6%) in a water-miscible dust. The *epsilon* isomer could not be used as it was not available in sufficient quantities. Commercial grade benzene hexachloride was not considered as it contains other isomers and impurities which would be more toxic than the *delta* isomer.

In order to determine the toxic properties of *delta* isomer, 7 sows were put into clean, separate pens about 100 sq. ft. in area a few hours before farrowing. Each pen contained a shelter, food, and water vessels, and had been dusted with ½ lb. of 6 per cent *delta* isomer in a water-miscible dust.

Each pen and bedding was dusted immediately after the sow farrowed and every seventh day for eight weeks. At the end of this period, the pigs were weaned and moved to another lot. There was a total of 42 baby pigs in the seven lots. Toxic symptoms were not observed in any of the animals.

CONCLUSIONS

1) Weaned pigs infected *per os* with kidney worm larvae and slaughtered at approximately 6 months of age had an average daily gain of 1.09 lb. per day and an average slaughter weight of 170 lb. Control hogs slaughtered at approximately 6 months of age had an average daily gain of 1.57 lb. per day and an average slaughter weight of 235 lb.

2) Commercial benzene hexachloride and the *delta* and *epsilon* isomers will destroy, in twenty-four hours, 99 to 100 per cent of 18- to 20-hour-old swine kidney worm larvae. *in vitro*.

3) Commercial benzene hexachloride and the *delta* and *epsilon* isomers do not have an inhibitory effect on the embryonation or hatch of swine kidney worm eggs.

4) *Delta* isomer, six per cent, in a water-miscible dust was not toxic to young pigs exposed every seventh day from birth to 8 weeks of age.

5) The *delta* isomer of benzene hexachloride may prove to be an important aid in the control of the swine kidney worm.

Infectious Bronchitis and Newcastle Disease

Diseases of the respiratory group in chickens present the most difficult task in differential diagnosis, even when every available laboratory means is at hand. The two diseases of the group that are most alike are bronchitis and Newcastle disease.

Considered on the basis of geographic distribution, bronchitis thus far has been diagnosed only in the United States, Canada, and England. Newcastle disease (ND), on the other hand, has been identified in every European country, including Russia and excepting perhaps Norway, Portugal, and Switzerland.

Both infections are acquired naturally by way of the respiratory tract. The post-mortem findings do not permit a differentiation, at least in the United States and Canada. The most reliable diagnosis of either disease is based on recovery of the virus. This is not difficult in the case of ND but is time-consuming in the case of bronchitis.

As a final check, a cross-immunity test will show that the ND-recovered bird is immune to this virus but susceptible to bronchitis and, reciprocally, a bronchitis-recovered bird resists a tracheal inoculation of this virus but is still susceptible to ND virus.

It is evident that ND and bronchitis are rather easily distinguished. But, there are other respiratory infections and there are other neurotropic diseases, so that bronchitis still has to be differentiated from a chronic respiratory disease possibly caused by a Rickettsia-like agent and coryza. Also, the nervous symptoms of ND may easily resemble those in avian encephalomyelitis, equine encephalomyelitis (in pheasants), and vitamin E deficiency.—*F. R. Beaudette: Infectious Bronchitis and Newcastle Disease. Canad. J. Comp. Med. and Vet. Sci., 15, March, 1951: 65-71.*

Acute cecal coccidiosis is said to kill about 10 per cent of all chicks hatched in the United States.

The Successful Diagnosis and Treatment of Bovine Pyelonephritis

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SINCE THE FIRST report of pyelonephritis in the United States by Boyd in 1918,[1] veterinarians have generally regarded the condition refractory to treatment. Until the advent of antibiotics, this belief has led to the slaughter of many high-producing animals, some of which could have remained in the production line if modern therapeutics had then been available.

Pyelonephritis of the cow seems to be of increasing importance, and with the present high value placed on breeding and producing stock, as well as milk supplies, the veterinarian's ability to cure, rather than to suggest salvage, is demanded. Our laboratory has frequently diagnosed the disease in recent months, and has experienced favorable response to the recommendations for treatment as outlined below. McLaughlin[2] and Merriman[3] also report successful results following the same general line of therapy.

ETIOLOGY

Corynebacterium renale is implicated as the primary cause of pyelonephritis. The organism appears in exudates and cultures as a gram-positive diphtheroid bacillus. The bacilli do not vary greatly in morphology, all being rather short, stumpy rods which usually are a little thicker at one end than the other.[4] Other organisms such as streptococci, cocci, and streptobacilli are frequently associated with Corynebacterium in the exudates.[5]

The pathogenesis of the organism seems to be ascending in nature, and the spread within the herd very slow. In the majority of cases studied, the course of the disease has extended over a long period. Clinical symptoms do not become pronounced until the pathological changes are well advanced. After the onset of acute clinical symptoms, the course of the disease is usually rapid.[6] The appearance of acute symptoms often closely follows dystocia, parturition, retained placenta, mastitis, and other infections of the genito-urinary and mammary tissues.

DIAGNOSIS AND SYMPTOMATOLOGY

The diagnosis of pyelonephritis is not usually difficult. Painful, frequent micturition of a bloody, fetid, pus- and mucus-filled urine, highly alkaline in reaction, combined with a history of gradual decline in flesh and milk flow, and traumatic gastritis-like symptoms, are *prima facie* evidence of the disease. The temperature is usually elevated but not constant. Rectal examination of the urinary tract will reveal greatly enlarged kidneys and ureters which may cause pain when palpated. Stained smears of the urinary sediment will reveal numerous clumps of *C. renale*, pus cells, and tissue debris. The finding of the organism alone can not be relied upon since it has been isolated from apparently normal urinary tracts.[7] Careful examination and study of the history and symptoms will differentiate the condition from traumatic gastritis, Johne's disease, metritis, acetonemia, and other infections.

PROGNOSIS AND TREATMENT

The prognosis is guarded in pyelonephritis due to the extensive damage which may have occurred in the kidneys and ureters. However, spectacular results have been observed following the treatment outlined, even when death seemed imminent.

Since *C. renale* prefers an alkaline medium for growth, and produces an extremely alkaline urine, acidifying of the urine is indicated. This is accomplished through the administration of sodium biphosphate ($NaH_2PO_4 \cdot H_2O$) either by drench or capsule. One pound of the chemical divided into four 4-oz. daily doses is usually sufficient.

Marked improvement may follow the treatment with sodium biphosphate alone but can not be depended upon.[8] Combined therapy with procaine penicillin G, in oil or aqueous suspension, has resulted in ap-

From the Department of Professional Services, Corn Belt Laboratories, Inc., East St. Louis, Ill.

parent complete recovery in a variety of cases. At least 2,000,000 units administered at the first call, followed by a similar injection forty-eight hours later, is recommended. This dosage might appear large, but experience has proved that there is less danger of relapse where the larger dosage is employed than if smaller more frequent doses are administered. In the event of relapse, the same treatment may be repeated. Some few cases will require continuous treatment for longer periods. This line of therapy has been followed by resolution of symptoms in a few days and, in some instances, within forty-eight hours.

Not all of the cases reported have been personally observed by our laboratory staff; however, of those which we have personal knowledge, 7 showed complete recovery after one year; 4 after six months; 1 failed to respond to treatment; and 1 animal relapsed, requiring additional treatment. The latter now appears to be recovering satisfactorily. In a number of instances where the treatment has been recommended to veterinarians by telephone or personal contact, we have received reports of favorable response to the treatment outlined.

COMMENT

1) The diagnosis and treatment of bovine pyelonephritis are described.

2) It is believed that any practitioner following the therapy recommended will experience surprising and pleasing results not heretofore thought possible.

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Neurotropic Virus Isolated from Dog with Nervous Distemper

Many theories, hypotheses, and observations have been in favor of the possible existence of a neurotropic virus or viruses closely associated with nervous distemper.

The Laidlaw-Dunkin virus, by whatever route it is injected, produces distemper in the ferret with all its classical symptoms, but rarely or never with evidence of the involvement of nervous tissue. In this investigation, a strain of distemper virus ("Glasgow S123") was isolated with very definite neurotropic properties.

Ferrets and dogs are susceptible to the infection, developing thermal and clinical reactions after inoculation. Nervous syndromes form the main characteristic of this virus. Rabbits, guinea pigs, and mice are not susceptible to this virus by any route of infection.

In the dog, a thermal reaction usually commences between the third and sixth day and may last for one or two days, and sometimes only for a few hours. A diphasic thermal reaction is quite common. Mortality in susceptible puppies is high. However, 2 dogs over 2 years old and of unknown origin were found to be more resistant to the subcutaneous inoculation of virus. The duration of the disease is about six to twelve days. Nervous syndromes which were encountered among all fatal cases are described.

Serologically, the Glasgow S123 virus is immunologically identical with canine distemper virus Laidlaw-Dunkin, Wellcome hard pad virus, and Green distemperoid virus.

This virus is unrelated to lymphocytic choriomeningitis virus, as shown by animal inoculation tests, complement-fixation and cross-immunity tests.—*Wassef M. The Isolation of a Neurotropic Virus from a Dog Suffering from the So-called Nervous Distemper. Brit. Vet. J., May, 1951.*

Do not underestimate the importance of airborne Brucella infection, the World Health Organization was warned at a recent conference in Washington, D. C. The advice was that infection by this method can be presumed possible wherever dried animal substances or excreta are found.—*FAO-WHO Rep., Jan. 1951.*

Soft Fibroma (Molluscum Fibrosum) in Dogs

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Soft fibroma is a new growth of cutaneous connective tissue which may be pedunculated or may have a broad base without a peduncle. Usually it is round with a smooth or lobulated surface. Its occurrence may be either single or multiple. In the latter case, there may be many tumors covering the entire skin surface. The sizes of the lesions vary. Their consistency is soft and, superficially, they resemble cysts. Like other forms of fibroma, they are attached to, and move with, the skin.

In dogs, molluscous fibromata usually develop suddenly and, as a rule, they disappear after several days. Such growths in dogs resemble *Molluscum contagiosum* in human beings, a lesion caused by a virus. The virus of *M. contagiosum* from human patients has been studied by the use of the electron microscope. The average size of the brick-shaped virus particles was found to be about 389 by 279 millimicrons.[1]

The following is a case report of fibroma molluscum in a male dog approximately 3½ months of age:

The owner obtained the dog about seven weeks previously from the S.P.C.A. About one week later, an infectious diarrhea developed and was treated satisfactorily. At that time, a growth about the size of a large pea was noted in the skin of the left upper cervical region. It was removed surgically. Four days later, other growths appeared on the abdominal wall, and gradually more of them developed over the body.

The temperature was 101.4 F.; pulse, 62; respiration, 26. The appetite was good, feces normal, and a general examination of the animal did not show any deviation from normal except the skin lesions or growths as described herein.

On the skin of the distal abdominal region, there were small discrete, pearly eruptions of a globular shape, whitish or pinkish in color, surrounded by an inflammatory area, and of a soft consistency, resembling small cysts. The sizes ranged from that of a mustard seed to that of a large pea. Similar eruptions were found on the neck, shoulder, and back region. The majority of them, however, were on the abdominal wall. There was evidence of itching, since the animal would scratch some of the lesions.

Fig. 1—Photograph taken on day of initial examination.

One tumorous growth was excised for biopsy and artificial inoculation into an ex-

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[1]Rake, G., and Blank, H.: The Relationship of Host and Virus in Molluscum Contagiosum. J. Invest. Dermat., 15, (1950):81.

perimental dog. Four days later, many of the described lesions had disappeared. Within eight days, all described skin lesions completely disappeared leaving only whitish spots. The animal remained well without evidence of a return of skin lesions for six months, when it was killed accidentally in an automobile accident.

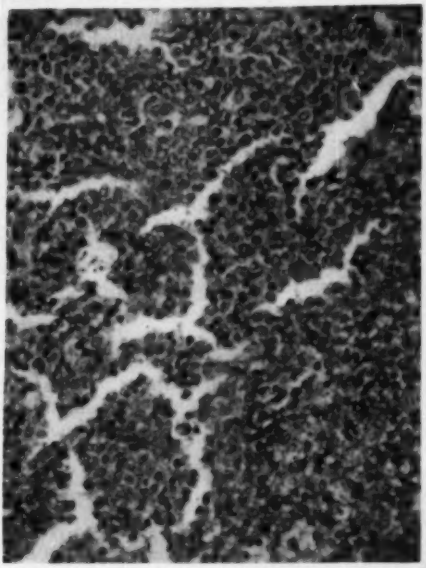

Fig. 2—Photomicrograph of a section of a tumor.

Histopathological findings would indicate *Molluscum fibrosum*.

Experimental Results.—Tissue was macerated and suspended in sterile saline solution. This suspension was injected intraperitoneally into an apparently normal dog. The animal was observed for eight weeks. No evidence of tumor growth was noted during this period.

Fig. 3—Photograph taken two weeks after initial examination.

Warning on Quaternary-Detergent Combinations

It was found (*J. Milk and Food Tech.*, Jan.-Feb., 1951) that there is no truly nonionic detergent, that all ionize to some degree and, more important, one is yet to be found that does not have a detrimental effect upon the bactericidal power of a quaternary disinfectant with which it is combined. This means, according to the authors, that use of the two together may have no greater sanitizing effect than soap and water—a dangerous situation because it leads to reliance on protection that does not exist.

Niacin and Cobalt Shortages

The basic chemical in niacin manufacture is quinoline, much of which is on urgent defense allocation for mildew-proofing textiles used by the Armed Forces. Any cutbacks in niacin deliveries ordered by chemical companies will hit feed maunfacturers first, because they are rated below the milling and baking industries.

Cobalt is in short supply because it goes into the making of jet engines and other war equipment—so short, in fact, that it is likely to be prohibited in poultry feeds, although ruminants and swine will continue to get it where needed.

Clinical Use of Terramycin in Canine Practice

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VETERINARY LITERATURE reveals only a few references to the use of terramycin in canine practice. For this reason, it is felt that the following case reports involving the use of this new antibiotic may be of some value to the small animal practitioner.

Terramycin was used in capsules of 100 and 250 mg. for oral administration, and in sterile vials of 250 mg. dry powder for dilution for intravenous injection. Usually 10 cc. of sterile distilled water was added as the diluent; occasionally this was increased to 20 cc. on the advice of the manufacturer, in order to avoid phlebitis. In no case, however, did this complication arise.

Presented here are representative cases: (1) those which were treated orally, and (2) those which received the drug intravenously. The diagnoses of the cases are developed under "Discussion."

CASES TREATED ORALLY

Case 1.—A female Boxer, 5 months old, weighing 40 lb. had been previously vaccinated for distemper.

Diarrhea, anorexia, and dysphagia had been present for three days. The animal was dull, the conjunctivae were injected, there was a severe tonsillitis, and the submaxillary lymph nodes were enlarged. The temperature was 102.5.

Treatment.—One capsule of terramycin (250 mg.) was administered every eight hours. No other treatment was given.

The patient was much improved after two doses, and completely normal in forty-eight hours. Treatment was continued for four days. There has been no recurrence after two months.

Case 2.—A male Chow-type dog, 1 year old, weighing 30 lb. was presented for examination.

The dog, recurrently ill for two weeks, had been much worse in the last four days. The temperature was 103.5 F. There was a hacking cough, anorexia, conjunctivitis, and purulent nasal discharge. The dog was weak, thin, and listless.

Treatment.—Canine distemper antiserum (30 cc.) was administered; terramycin capsules (250 mg.) every eight hours. Supportive treatment consisted of daily vitamin B complex injections.

The patient ate voluntarily on the second day. On the third day, the eyes were distinctly improved. The dog was discharged on the fifth day with only a slight cough on excitement, and occasional sneezing. There has been no recurrence after three months.

Case 3.—On November 20, a female mongrel Spitz, 6 weeks old, weighing 4 lb. was presented with the following symptoms: slight diarrhea, thin, anorexia, temperature 101.5 F. An antidiarrheal mixture was dispensed with good results. On December 12, severe diarrhea was again seen with rhinitis, coryza, and anorexia. The temperature was 102.5 F. Procaine penicillin in oil (150,000 units) was administered, and 0.25-Gm. tablets of sulfadiazine were given three times a day. On December 16, the dog was much worse. There was a severe cough, purulent nasal discharge, thin, watery stool, and she appeared very weak. A cough syrup was dispensed, as were terramycin capsules (100 mg.), with instructions that they be administered one every twelve hours.

Severe pulmonary râles were noticed on December 18. The continuation of terramycin therapy was advised. On December 20, severe champing fits and tonic-clonic convulsions were seen. Euthanasia was recommended and performed.

Case 4.—A female Pomeranian crossbred, 3 years old, weighing 16 lb. had been distemper-immunized two years before this present illness.

The patient, presented because of anorexia, "vomiting foamy phlegm," gagging, and shivering, had been constantly licking the anus for two days. Examination showed a temperature of 104 F. with a severe tonsillitis and also an abscessed anal sac. The anal sac was treated surgically and the tonsillitis by injections of procaine penicillin in oil at the rate of 300,000 units per day. The first day's dosage was amplified with 100,000 units of crystalline penicillin G in saline solution. The recovery was uneventful and the patient was discharged on the fourth day.

Two days later, this dog was returned to the hospital with the following relapse symptoms: The temperature was 103, there was severe tonsillitis with anorexia, and the dog was shivering. In our experience, penicillin or streptomycin, or both, have proved valueless in such cases and fatal termination usually occurs.

Treatment.—The animal was hospitalized and terramycin capsules (250 mg.) were administered, one every twelve hours. Daily vitamin B complex injections were also given.

Results.—The patient was discharged on the seventh day completely normal. No recurrences have been seen in more than two months.

Case 5.—A male Beagle Hound, 2½ years old, weighing 32 lb. was presented with a severe cough, diarrhea, anorexia, pulmonary râles, puru-

The materials used were supplied through the coöperation of Dr. G. R. Donner of Chas. Pfizer & Co., Inc.

lent nasal and ocular discharge, and a temperature of 104.5 F.

Treatment.—The animal was hospitalized and terramycin capsules (250 mg.) were administered, one every six hours. Daily vitamin B complex injections were also given.

Results.—Tonic-clonic convulsions were noted on the fifth day and euthanasia was recommended and performed.

Case 6.—A 1-year-old male Cocker Spaniel, weighing 29 lb., was vomiting and gagging and had not eaten for one day. There was a severe tonsillitis, with enlarged submaxillary lymph nodes, and a temperature of 102 F.

Treatment.—Terramycin capsules (250 mg.) were administered, one every eight hours. Treatment was discontinued after three days because patient had returned to normal. There have been no recurrences in over two months.

Case 7.—A 3-year-old female Terrier-type dog, weighing 21 lb., was presented with anorexia, tonsillitis of three days' duration, diarrhea, a history of vomiting "phlegm," and a temperature of 103.5 F.

Treatment.—Terramycin capsules (250 mg.) were administered as follows: for the first two days, one every eight hours; for the third day, one every twelve hours.

Results.—The patient returned to normal after the third day and no recurrences have been seen in more than six weeks.

Case 8.—A male Boxer, 3½ months old, weighing 14 lb. had coryza, tonsillitis of two days' duration, anorexia, diarrhea, and a temperature of 103.5 F.

Treatment.—Canine distemper antiserum (15 cc.) was administered, along with terramycin capsules (100 mg.), one every six hours.

Results.—The patient was normal on the fifth day except for one attack of gagging. Treatment with terramycin was continued for three days more in order to attempt to avoid relapse in an underweight and extremely debilitated patient. No relapse occurred, but a bronchitis-like cough persisted for almost three weeks after recovery. Six weeks later, no relapse had occurred.

Case 9.—A male Boxer, 2½ months old and weighing 19 lb., was presented with a history of anorexia for two days, with severe tonsillitis, gagging, dysphagia for one day, and a temperature of 102 F.

Treatment.—One terramycin capsule (250 mg.) was administered every twelve hours.

Results.—The patient ate on the second day and was entirely normal in four days.

CASES TREATED INTRAVENOUSLY

Case 10.—A crossbred male Setter, 1 year old and weighing 41 lb., had previously recovered from distemper.

There had been two office visits in the previous four days. Examination showed a temperature of 102.5 F., anorexia, dullness, slight cough, tonsillitis, diarrhea, and the animal had been vomiting phlegm. He had been treated with penicillin, streptomycin, and sulfonamides.

On the fifth day, his condition was much worse, and the temperature was 106 F. The owner noticed two "head tremors" at home. These were probably not champing fits but muscular twitching.

Treatment.—The animal was hospitalized and daily intravenous injections of terramycin (250 mg.) were given for six days.

Results.—The patient began to eat on the second day and was discharged on the seventh day. There have been no relapses in almost two months.

Case 11.—A 6-month-old male Hound-type dog, weighing 30 lb., was suffering from the effects of a tight rubber band having been placed around his neck several weeks previously. This resulted in a severe cut, about 7 in. long and 1½ in. deep, into the ventral surface of his neck. The wound had become filled with tough exuberant granulation tissue, making approximation of the wound edges impossible. There were also several smaller cuts on the dorsal surface of the neck. The wounds were purulent and the patient was severely debilitated. He had a good appetite, however, and the temperature was normal. The rubber band was cut and easily removed.

Surgery was performed to remove as much of the granulation tissue as possible. When completed, the normal contours of the neck were reestablished. Penicillin was given postoperatively in daily doses of 300,000 units.

Symptoms.—The patient was doing well until the third day, at which time he refused food and showed dysphagia. The tonsils were inflamed, the temperature was 103 F., and the animal was dull and listless.

Treatment.—One intravenous injection of 250 mg. of terramycin was given. This was followed in several hours by intense vomiting spasms and retching and a great deal of discomfort. A sedative was administered parenterally. The following morning, the patient had a normal temperature, ate, and retained food. It was felt that this dog could not tolerate terramycin and, therefore, no further use of the drug was made. Penicillin was continued for the next two days, particularly for its effect upon the surgery.

Results.—The patient was discharged a week after the operation (4 days after the single dose of terramycin) and there have been no recurrences in five weeks.

Case 12.—A male Irish Terrier, 9 years old and weighing 24 lb., was presented on December 30 with a history of vomiting and anorexia for one day. The temperature was 102 F. and there was evidence of tonsillitis. Penicillin and streptomycin were injected and sulfadiazine was prescribed.

On January 2, the temperature was 101.5 F., the animal was improved and eating fairly well. Penicillin and streptomycin were again injected, and sulfadiazine was continued for three more

days. On February 5, there was anorexia, purulent nasal and ocular discharges, inflamed ears, dyspnea, tonsillitis, and the animal was weak.

Treatment.—The patient was hospitalized and given intravenous injections of terramycin (125 mg.) once a day.

Results.—The animal became progressively weaker and debilitated and died on the fourth day.

Case 13.—A female Spitz-type dog, 4½ years old and weighing 30 lb., had been inoculated for distemper four years previously. She was presented with a cough, rhinitis, conjunctivitis, photophobia, vomiting, diarrhea, anorexia, and dullness. There was marked tonsillitis for two days, and the temperature was 102.6 F.

Treatment.—The animal was hospitalized and huge doses of penicillin and streptomycin, as well as supportive treatment, were administered. The diarrhea was controlled on the second day. By the fourth day, however, the anorexia, dysphagia, and the fever persisted and the pharyngitis and tonsillitis were still present. Single intravenous doses of terramycin (125 mg. per day) were given. All other treatment was abandoned.

Results.—Four days later, the patient was discharged with normal throat, temperature, and appetite. No recurrences have been seen in one month.

Case 14.—On December 7, a female Spitz-type dog, 1 year old and weighing 28 lb., had a cough, tonsillitis, anorexia, debility, was vomiting, and had a temperature of 103 F. Penicillin and streptomycin were administered parenterally.

On December 9, the patient was much improved, with a temperature of 101.8 F., and she was beginning to take food. Penicillin and streptomycin were again administered parenterally. The owner did not wish further treatment.

On December 21, the patient was returned in much worse than her original condition. The temperature was 103 F., she was debilitated, very weak (almost unable to stand), vomiting continually, and was severely dehydrated.

Treatment.—The animal was hospitalized and given terramycin intravenously, 250 mg. in single daily doses.

Results.—The patient was much improved by the third day and was finally discharged on the ninth day. No recurrences have been seen in two and one-half months. This patient received supportive treatment, but not until the fourth day when it became apparent that the drug actually was of some value.

DISCUSSION

Quite obvious by its absence is the term "diagnosis." Although many, if not all, of the above cases might be called distemper, the indiscriminate use of this label is objectionable. It has too long been the catchword of veterinary diagnosis. Happily, it is becoming more and more difficult for the small animal practitioner to convince his colleagues, and even his clients, that most nonsurgical diseases of dogs are canine distemper. Appreciated much more, I believe, is even a simple statement, such as "We don't know exactly what infection this dog has, but the most modern and most successful treatment for these cases is . . .". Of course, much more specific answers are justifiably expected from investigational workers.

In view of this feeling, therefore, diagnosis has been omitted. Under no circumstances, then, could it possibly be stated that terramycin "cured 11 out of 14 distemper cases."

The average veterinarian in the ordinary small animal hospital is confronted each day with the problem of treating unnamed infections in a practical, economically feasible, yet intelligent manner. Terramycin seems to be of use here. Cases 4, 10, 13, and 14 showed this drug to be successful where other antibiotics apparently were not. Case 11 indicates that one dose of terramycin seemingly cured an infection which previous penicillin therapy could not prevent. This particular patient is the only case in which sequels of any type were observed. None of the others exhibited any ill effects from either oral or intravenous administration of the antibiotic.*

Usually, the same vein was used daily. Although care was taken to avoid perivenous infiltration, no doubt some small amounts escaped into the surrounding tissue. Only 2 of the cases, however, showed slight pain, swelling of the limb, or mild lameness, even after repeated injections. In no case did lameness persist for more than two days after treatment was discontinued. Rotation of the veins probably would have eliminated this difficulty. No cases of sloughing occurred.

Recommended dosages were 25 mg. per pound orally and 5 mg. per pound intravenously per 24-hour period. The exact figures for the above cases were 29 mg. and 6 mg., respectively. It should be noted, however, that 2 of the most successful cases were

*Advice was received from the manufacturer to be careful in regard to the concentration of terramycin in solution and also the rate of intravenous injection. Unfortunately, this advice was received after most of the cases had been treated by injections of solutions containing 125 to 250 mg./10 cc., which were administered over a period of approximately thirty seconds. This concentration and rate of injection were supposed to be too high and too rapid, but no serious untoward results were experienced.

treated with amounts below those recommended: case 1, less than 19 mg. orally; and case 13, slightly over 4 mg. intravenously.

CONCLUSIONS

Terramycin is a safe, effective, new antibiotic for use in canine practice.

Terramycin in Selected Small Animal Cases

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Up to the present time (May, 1951) little information on terramycin[1, 2] has been seen in veterinary publications. We followed the manufacturer's recommendations for dosage, *i.e.*, the dosage of terramycin was based on a level of 25 mg. per pound of body weight per day orally, usually divided into two to four doses. Our results in the treatment of about 15 cases have been good.

Case 1 (Pneumonia).—A 4-month-old female Collie weighing 35 lb. was presented with a history of a cough, rapid, labored breathing, and decreased appetite for the past two to three days. I had been giving distemper serum to this dog every two weeks since it was 2 months old. On examination, the temperature was 103.4 F.; mucous membranes normal; the tonsils, larynx, and pharynx were enlarged and inflamed. There was no discharge from the nose or eyes; respiration was rapid. There was marked congestion of the lungs with râles in the left lung only. Our diagnosis was pneumonia and the treatment was: terramycin 250 mg., orally, four times a day; zymacaps with folic acid, one capsule daily; metrazol tablets, ½ tablet three times daily. The dog gradually improved and in seven days was completely normal.

Case 2 (Encephalitis).—On December 27, a 4-year-old, 30-lb. Cocker Spaniel bitch was presented with a history of having been perfectly normal until the day before, when she had a severe fit. She had been vaccinated with three injections of virogen when 6 months old.

On examination, the temperature was 103.5 F., the mucous membranes were congested, and the dog was extremely nervous. There was excessive salivation, the heart rate was increased, and the pupils dilated. Fecal examination was negative for parasites. A diagnosis of encephalitis was made.

We placed the dog on terramycin, 250 mg. three times a day, and antifox encephalitis serum (30 cc.) was given subcutaneously. Supportive treatment consisted of 5 cc. B complex solution subcutaneously, and 5 cc. dilantin sodium intramuscularly three times a day as a sedative. The dog failed to respond and died on January 1. She lived 5 days, becoming gradually more nervous and having more severe and frequent fits daily. She continued to eat until the last day.

Case 3 (Hard Pad Disease).—A German Shepherd male, 3 years old, was presented with the typical symptoms of hard pad disease. He had recovered from distemper about 8 months before. On examination, the temperature was 104.5 F.; there was a hard calcis condition of the nose and pads of all four feet, which were very tender; there was a marked discharge from the nose; conjunctivitis; and partial loss of appetite. The dog was extremely listless.

The owner refused to hospitalize the dog, so it was treated as an outpatient. The owner was given a prescription for five days of terramycin therapy, figuring 25 mg. per pound per day orally, to be divided into four doses. We also prescribed Upjohn's multivitamin with folic acid zymacaps, and cod liver oil ophthalmic ointment for the eyes, with instructions that this ointment also be rubbed on the nose and pads of the feet. During these five days, the temperatures recorded were 105.0 F., 103.8 F., 104.0 F., and 104.2 F. I had the owner renew the prescription and continue treatment for another five days, with the following temperatures recorded: 103.8 F., 104.0 F., 102.0 F., 102.8 F., and 102.5 F. After ten days of treatment, the physical condition of the dog was much the same as when we started. During this time the dog ate intermittently.

The owner felt she could not afford further treatment, especially since the dog showed no improvement in ten days. I persuaded the owner to let me give the dog a blood transfusion, but this procedure did not seem to produce results either. We continued with this case and the dog has finally made a complete recovery. When we stopped

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Dr. Gerald R. Donner of Chas. Pfizer & Co., Brooklyn, N.Y., supplied us with the terramycin used in the treatment of these cases.

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giving terramycin, I had the owner continue the multivitamins. It is our opinion that terramycin helped to effect a cure in this case though it could not be considered a specific cure.

Case 4 (Encephalitis).—On December 28, we examined a 1-year-old Fox Terrier, male, 25 lb., presented with a history of several fits during the last two days. Six weeks previously, the dog was brought to the hospital and was treated for distemper with serum, sulfamerazine, and vitamin therapy. The dog had then made an uneventful recovery in about ten days.

On examination, the temperature was 104.5 F., mucous membranes congested, pupils dilated, and the dog was extremely nervous. The examination brought on a severe fit which lasted about ten minutes. After coming out of the fit, the animal was uncoördinated for about thirty minutes. Fecal examination was negative for parasites. Our diagnosis was encephalitis, and treatment was the same as the aforementioned case. The dog became progressively worse each day and by the third day was in a comatose condition and finally died.

Case 5 (Enterostomy).—One of our most interesting cases was a 35-lb. Cocker Spaniel bitch which was brought in to be spayed. The operation was performed after a twenty-four hour fast. The dog was doing well, the temperature stayed under 102 F. and the incision was healing by first intention until the fourth day. At that time, the dog chewed the bandages and stitches out. This opened up the incision along the midline and 3 ft. of intestines had fallen out. By the time we discovered this, she had eaten about 18 in. of the intestine. The patient was then given nembutal, the intestines washed off with warm saline solution, and an end-to-end entero-enterostomy was performed, using the closed technique of Parker-Kerr. Terramycin was then administered immediately after coming out of the anesthesia, and continued for eight days. The temperature remained under 102.5 F. the entire time. After the dog came out of the anesthesia the incision was bandaged, and a surgical stockinette was placed on the entire length of the body. A 36-in. cardboard Elizabethan collar was placed around her neck. The dog was put on a fat-free diet of fruit juices, cereals, and toast. We did have some trouble getting normal bowel actions—she was either constipated or diarrheic. This complication was treated symptomatically. The dog was discharged on the ninth day with normal temperature and bowel action.

Case 6 (Wound Infection).—A 65-lb., 2-year-old male Fox Hound was presented at the hospital after being in a fight with a fox three days previously. There was an acute orchitis. The left testicle was denuded of the scrotum and tunica and was starting to show signs of necrosis. The right testicle had several puncture wounds from the teeth of the fox, and was suppurating but was still enclosed in the scrotum. There was a great deal of swelling in and around the testicles. The temperature was 106.5 F. The dog was immediately placed on terramycin, 1,750 mg. per day orally. The wounds were treated locally. In forty-eight hours, the temperature had dropped to 103 F. The dog was anesthetized and both testicles removed. By the sixth day the temperature was back to normal. Terramycin was given two more days, and the dog was discharged on the eighth day with the scrotum wound no longer suppurating and the wound practically closed.

Cases 5 and 6 are evidence of the most successful application of terramycin we have seen. The terramycin administered prevented any possibility of infection of any type and helped to assure complete recovery.

Discussion.—The cases described here are interesting and serve to prove the extreme effectiveness of this new antibiotic. In view of its broad antibacterial range based on *in vitro* tests,[3] terramycin would certainly appear to be the antibiotic of choice, since it has been found effective against more of the most common pathogens encountered in veterinary medicine.

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Mange in young pigs can be a serious determent to profitable production. If skin lesions are present, mange treatment is justified.—*L. P. Doyle, D.V.M.*

Canine Brucellosis – A Review of the Literature

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THE EPIZOOTIOLOGY of canine brucellosis is worthy of consideration from both veterinary and human health standpoints. The dog, if capable of serving as a mechanical or biologic vector of Brucella organisms, could present a serious problem in the control and eradication of brucellosis. An infected house dog might transmit the disease to the owner or to his family. Brucella-infected dogs could be of serious consequence to the livestock industry as well as to human health. These considerations prompted the author to review the literature on the subject.

RANDOM SAMPLING BY AGGLUTINATION TESTS

The investigations of several workers during this century revealed Brucella agglutinins in the blood of a number of dogs. The serum of 1,565 dogs examined and reported during this era disclosed 241 reactors (15.39%). The data are summarized in table 1.

Thomsen[39] found that the dogs from rural areas were more frequently positive to the agglutination test than animals from the city.

Feldman and co-workers[10] examined 500 dogs from rural environs and found that 52 (10.5%) reacted to the agglutination test. Maximal titers were as follows: 17 serums reacted at the 1 : 12 level; 19 at the 1 : 25 level; 11 at the 1 : 50 dilution; and 5 reacted at the 1 : 100 dilution or higher. Fourteen animals, which had demonstrable serum agglutinins, were killed and subjected to bacteriologic examination. Brucella were not recovered from any of the tissues by employing guinea pig inoculations.

Van der Hoeden[35] tested the serum of 442 dogs and found that 72 (16.29%) contained agglutinins. Maximal agglutinin titers were as follows: 41 serums reacted at the 1 : 25 dilution; 22 at the 1 : 50 level; 5 at 1 : 100; 1 at 1 : 200; 1 at 1 : 400; and 2 at 1 : 800. Three animals which had titers were killed and examined bacteriologically. An aërobic strain of Brucella was isolated from the blood of 1 of the animals. Van der Hoeden considered the organism to be *Brucella abortus* on the basis of dye bacteriostasis tests.

Both van der Hoeden[35] and Feldman, *et al.*,[10] concluded from serologic investigations that the agglutinins in the blood of their dogs were due to the classical Brucella and not the related organism, *Brucella bronchisepticus*. Alice Evans[8] observed that *Br. bronchisepticus* was agglutinated at a low dilution by high titer *Br. abortus* antiserum. The reactions were such that they would not impair the use of the serum-agglutination test for diagnostic purposes. Hence, the titers observed in dogs would appear to be quite specific and in high dilution due to *Br. abortus*, *Brucella suis*, or *Brucella melitensis*.

SPONTANEOUS BRUCELLA INFECTIONS IN DOGS

Dargein and Plazy[6] observed a bitch which whelped 3 dead young and whose serum contained Brucella agglutinins. The dog shared quarters with 14 naval officers, seven of whom were hospitalized with Malta fever (brucellosis). None of the men used goat milk or cheese. Goats and sheep in the surrounding territory were free of the infection. The dog was destroyed, but bacteriologic examinations were not made. Thereafter, further cases of brucellosis were not observed among naval personnel. The authors concluded that the infection had been contracted from the dog.

Nenzani[29] assumed that a bitch which aborted had served as the source of infection for a human patient. The owner of the dog had assisted in removing fetal membranes after the animal aborted. Considerably prior to this time, the dog had been seen eating aborted material from a cow. The dog reacted at the 1 : 5,000 dilution to the serum-agglutination test. Unfortunately, the animal was killed accidentally before conclusive bacteriologic examinations were conducted.

Planz and Huddleson[30] observed a 3½-year-old male Fox Terrier which had been languid and listless for six weeks. The appetite was normal, and neither diarrhea nor vomition were reported. At the time of examination, the temperature was 105.8 F., the pulse rate was 100, the rear legs were stiff, movement appeared to be painful, and the right testicle was swollen to about twice its normal size. The Brucella serum-agglutination test was positive at the 1 : 500 dilution. Right unilateral castration was performed. *Brucella suis* was isolated from the pus obtained from a testicular abscess which measured 5 by 15 mm. The animal made an uneventful recovery. One month after the operation, the agglutinin titer was still at the 1 : 500 value.

Whitby and co-workers[38] reported a case of suppurative epididymitis in a 12-year-old dog. Except for a swollen testicle, the symptomatology was vague. *Brucella abortus* was isolated from purulent material recovered from the epididymis.

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Davis[7] describes a probable case of brucellosis in a 4-year-old Springer Spaniel. For two months prior to examination, the animal had lost weight, the coat had become progressively more rough, and the rear legs appeared to be stiff. The appetite remained normal. Diarrhea or emesis were not observed. On initial examination, the temperature was 105 F., the right testicle was slightly enlarged, and the spleen and regional lymph nodes could be palpated. The dog's serum reacted to the agglutination test in a 1 : 2,000 dilution. Castration was performed. An abscess, 2.5 by 3.75 cm., was found in one of the testicles. Pus from the lesion was cultured, but not under an increased carbon dioxide tension. Brucella were not recovered. A guinea pig which was inoculated with the purulent material showed evidences of brucellosis at autopsy. Its serum showed a titer of 1 : 25, but Brucella were not isolated from the spleen. Eight weeks after castration, the dog appeared well; however, Brucella agglutinins still persisted at a 1 : 1,000 level. While Davis was unable to recover Brucella from this patient, there seems to be little doubt that Brucella were the causative agent.

Nolan[24] had described two infections in dogs which were apparently caused by Brucella. One of the animals had consumed an unknown quantity of meat from horses which had been inoculated with *Br. suis*. Three months later, the dog had a dull dry coat, the appetite was normal, the temperature was 103.4 F., and the right testicle was four times its normal size. The agglutinin titer was 1 : 450 which was the highest dilution tested. The animal was treated with neoprontosil® (Winthrop-Stearns) and aspirin. The swelling gradually subsided. Two weeks after the initial attack, the left testicle began to swell and reached about five times its normal size. Treatment was not undertaken. The organ gradually returned to its normal size, but remained indurated. Four weeks following the initial attack, the agglutinin titer reached a peak of 1 : 7,500. The titer had dropped to 1 : 400 two months later. The final outcome of the case was not reported. The second case described by Nolan was a mongrel male with a right testicular abscess approximately 10 in. in circumference. The dog refused food for about one week. The abscess ruptured and only the tail of the epididymis remained. A sample of blood was found to have a Brucella agglutination titer of 1 : 20,000. Undoubtedly, both these cases were due to Brucella; however, bacteriologic evidence is lacking.

Karlson and Clausen[10] examined a 9-year-old German Shepherd which had been fed Brucella-infected milk for several years. An agglutinin titer of incomplete at 1 : 100 was observed. The dog was isolated and kept under observation in the laboratory for three months. During this time, the ration consisted of meat and dog biscuits. Twenty-seven attempts to isolate Brucella from the blood and five attempts to recover Brucella from the feces were unsuccessful. The animal was then fed milk known to contain *Br. abortus* for two months. After one month of this diet, *Br. abortus* was recovered from the blood by means of guinea pig inoculations. The animal remained normal during the five months of observation.

Beach,[1] in Wisconsin, examined a bitch which had aborted. The animal came from a farm on which there were Brucella-infected cattle. The general physical condition was fair, and the coat was rough. An agglutinin titer of 1 : 300 was demonstrated. Unfortunately, the animal was stolen and further study was impossible.

TABLE I—Results of the Random Sampling of the Dog Population by Means of the Serum Agglutination Test for Brucella Infections

Workers	Location	Total serum examined	Serums positive (No.)	Agglutinin titer range	Bacteriologic examinations for Brucella
Eyre, et al[9]	Malta	46	3	1:10-1:100	Negative
Kennedy[25]	Malta	114	15	1:10-1:30	Mesenteric lymph node of one dog positive.
Vallet and Rimbaud[31]	Not recorded	21	18	1:10-1:400	None recorded
Sergent and Bories[29]	Algeria	5	1	not given	None recorded
Caliri[4]	Sicily	67	0	.....	.....
Thomsen[29]	Denmark (rural)	58	9	1:10-1:500	None recorded
	Copenhagen (urban)	60	0	.....	.....
Grandi[13]	Bologna, Italy	165	66	1:10-1:100	None recorded
Poelma, et al[27]	Maryland, U.S.A.	60	5	1:100	Negative
van der Hoeden[32]	Holland	442	72	1:25-1:800	One positive blood culture
Feldman, et al[10]	Minnesota, U.S.A.	500	52	1:12-1:40	Negative
Birch[2]	Indiana, U.S.A.	27	0	.....	.....
Totals		1565	241	(15.39 per cent)	

Berman[3] observed 2 dogs, 1 used for herding and the other a house pet, living on a dairy farm where a number of Brucella-infected cows were kept. Of the seven people on the farm, five were hospitalized with brucellosis. The cow dog was emaciated and listless. The serum-agglutination test was positive at 1 : 1,600. Three weeks prior to these observations, the animal had been seen eating aborted material from a cow. The house dog, a spayed female, was apparently in good health, but had an agglutinin titer of 1 : 32. Cultures of blood and urine from both animals were negative for Brucella. The dogs were destroyed six weeks after the initial examinations. Brucella were not recovered from the spleen, liver, kidneys, or lymph nodes of either animal.

Gilman, Larson, and Green[13] observed a Collie which had aborted. The animal had been raised on a farm where bovine brucellosis was prevalent, but for several months before the abortion it had been kept in a brucellosis-free environment. The dam of this bitch had an agglutinin titer of 1 : 800. At the time of abortion, the patient's titer was 1 : 5,000. Two months following the abortion, the dog was thin and had a dull coat, but the temperature was normal. During the first six months of observation, the animal's condition gradually improved, but estrus did not occur. The agglutinin titer rose to 1 : 25,600 then declined during the following six months to 1 : 3,200. One year after observations were commenced, the dog was pregnant and in good health. The animal was killed accidentally and bacteriologic examinations were not performed.

Experiment Infections

Van der Hoeden[33-34] infected dogs with *Br. abortus* by the intravenous, oral, cutaneous, or conjunctival routes of inoculation. He concluded that 3 dogs had contracted the infection during twenty weeks' cohabitation with 2 infected animals. One or more tissues of each of the 3 animals yielded *Br. abortus* at autopsy. Agglutinins were present at thirty-one days, but not at eight days. The titers were 1 : 200, 1 : 400, and 1 : 3,200.

TABLE 2—Attempts by Various Workers to Artificially Produce Brucella Infections in Dogs

Investigators	Material and route of inoculation	Experimental animals (No.)	Bacteriologic findings	Remarks or conclusions
Van der Hoeden[33]	a) Br. abortus cultures. As high as 50 billion organisms, orally.	12	Tissues of 7 positive at autopsy.	12 dogs had titer; peaks ranged from 1:200 to 1:6400.
	b) Br. abortus cultures, infected guinea pig organs or pus rubbed on abraded or intact skin.	6	At autopsy, 1 dog positive (on abraded skin; killed 3 days following exposure)	3 dogs had titer; peaks ranged from 1:25 to 1:6400.
	c) Br. abortus cultures; conjunctivally.	5	Tissues of 1 positive at autopsy (50 million organisms given on first day and again on third day).	4 dogs had titer; peaks ranged from 1:200 to 1:1600.
Feldman, et al[11] — —	a) Br. suis culture suspensions intravenously.	3	One positive on tissues at autopsy. 2 dogs positive on hemoculture, 1 died.	Peak titers 1:800 to 1:1600. All appeared normal.
	b) Br. abortus culture suspensions intravenously.	2	Brucella in mesenteric, lymph node of 1 dog. Negative hemocultures on both.	As above.
	c) Br. suis culture suspensions orally.	3	Tissues negative at autopsy. Two positive hemocultures.	Agglutinin test negative to positive at 1:100.
	d) Br. abortus culture suspensions orally.	3	Tissues of 2 dogs negative at autopsy; 1 died, unsuitable for examination, 1 positive on hemoculture.	No demonstrable titers.
Morse, et al.[21]	a) Br. abortus. Aborted bovine fetus and placentas fed.	14 dogs fed material once, 1 dog fed material repeatedly.	8 dogs' tissues positive at autopsy. 1 positive hemoculture, 2 positive urine cultures, 1 positive fecal culture.	Agglutinin test negative to positive at 1:256 on infected dogs. 1 probable and 1 possible abortion. 2 infected females whelped normally.

Feldman *et al.*[19] housed 4 serum-negative dogs, 3 females and a male, with 3 females which had agglutinin titers ranging from 1 : 100 to 1 : 400. During a six-month period, the 3 animals with titers whelped normally. The serums of the 4 noninfected dogs remained negative. Bacteriologic examinations were not reported.

Olson and Feldman[20] observed a bacteriemia in 5 dogs at twenty-four hours following intravenous inoculation with *Br. suis*. These workers concluded that anaphylactoid shock was not closely associated with the bacteriemia and did not cause a significant alteration in the agglutinin titer.

Kerby and associates[37] administered three to 35 intravenous, or three to 39 intraperitoneal, inoculations of 10 billion *Br. suis* organisms each to 5 and 4 dogs, respectively. Brucella were isolated from the blood of all animals at six to fourteen days after intravenous exposure. Brucella were also recovered from the blood of 3 of the dogs which received intraperitoneal inoculations. *Brucella suis* was isolated from one or more of a large number of tissues from all the animals of the intravenously inoculated group. It was found in only 1 dog which had received the intraperitoneal injections. The peak titers in both groups ranged from 1 : 10,240 to 1 : 20,480. Three of the animals which had received intravenous injections died at thirty-eight, 198, and 261 days, respectively. All of those receiving the intraperitoneal inoculations survived. Severe general systemic manifestations observed in both groups of dogs included loss of weight, lassitude, weakness, anorexia, coma, emaciation, and finally death.

Cardona[4] reported that the intravenous route of inoculation surpassed other routes in producing infections. He concluded that the symptomatology of canine brucellosis resembled that of human undulant fever. His conclusions were based on observations made on only 4 dogs.

Thomsen[39] recovered *Br. abortus* from the urine of 1 dog at thirty-three days after intravenous inoculation.

Morse and associates[21] isolated *Br. abortus* from the urine of 2 dogs at four and eight hours after the consumption of aborted material. The organism was recovered from feces in only one instance. These investigators concluded that *Br. abortus* might be shed in the urine and feces of dogs after eating infected tissues, but that the number of organisms shed was few. In other work,[22] puppies were not infected by *ad libitum* feeding of cows' milk which contained *Br. abortus* for a period of more than 100 days. Agglutinins did not appear in the serums of any of the dogs during the course of the experiment. There are probably too few *Br. abortus* organisms present in the milk of infected cows to produce the disease in dogs.

McFadyean and Stockman[29] inoculated 5 pregnant bitches intravenously with *Br. abortus* cultures or uterine exudate from an infected cow, or both. Bacteriologic findings were not reported. However, 1 of the bitches aborted 3 dead pups nine days before term, while another expelled a mummified fetus at ten days before term. These events were suspected of being specifically due to Brucella. The other 3 animals may have aborted and eaten the material.

Tuxen,[40] Henricsson,[14] and Morse *et al.*[21] concluded that some of their experimentally infected dogs had aborted. However, only Tuxen and Henricsson substantiated their conclusions by bacteriologic proof. From the number of reports in the literature, one must conclude that there is strong evidence supporting the fact that Brucella may be incriminated as a cause of canine abortions. Further clinical and bacteriologic observations on this matter would be of epizoötiologic significance.

Van der Hoeden,[42] Thomsen,[39] and Cardona[4] did not observe any definite pathologic changes in their experimental animals. However, Thomsen[39] does mention finding multiple miliary yellow nodules under the kidney capsule.

Feldman and associates[21] demonstrated a small granuloma in the lung of a dog infected with *Br. suis*. They felt that specific lesions and clinical symptoms were of minor importance since the observable pathologic changes were not pathognomonic and the symptomatology was vague.

Margolis *et al.*[28] found that *Br. suis* persisted for as long as seven months in the reticulo-endothelial system of experimental dogs. The lymph nodes were most consistently involved from the standpoint of pathologic changes, but were not significantly enlarged. A pronounced reticuloendothelial reaction was observed which involved the sinus epithelium and reticular cells of the lymph nodes. Focal granulomata of an epithelioid nature were present in the lung, liver, spleen, lymph nodes, and kidneys.

Margolis and co-workers[30] also reported that in 4 of 9 dogs infected with *Br. suis*, a glomerulonephritis was demonstrable. The lesions were either of the acute necrotic type with glomerular involvement or of the nature of a progressive, active, subacute glomerulonephritis.

The findings of various investigators who have studied canine brucellosis are summarized in table 2.

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Infectious Cat Pneumonitis

Infectious cat pneumonia, which has also been designated "feline distemper" and "feline influenza", is caused by a psittacoid virus. The incubation period is from six to nine days, according to Dr. James A. Baker, director, Cornell Research Laboratories, Cornell University (in an address before the A.A.H.A., Atlantic City, N. J.). There is no cure for this disease. It is not fatal but may recur. It does not respond to sulfonamides and penicillin. Cats that have had the disease may recover and thereafter contaminate hospital patients.

Barn Warmth in Relation to Feed Utilization

In a study at the South Dakota experiment station, yearling heifers kept in a warm barn (average 41 F.) made faster gains on less feed than those housed in cold, open sheds (average 27 F.). Heifers in the cold barn ate 5.2 lb. more hay per head per day and gained only 96 lb. during a five-month period as compared with 157 lb. for the warm-barn group.—*Successful Farming, March, 1951.*

Atabrine has given encouraging results in the experimental treatment of histoplasmosis, but its effect on *Histoplasma capsulatum* is suppressive rather than lethal, with the infection flaring up after treatment is stopped.—*Pub. Health Rep., May 4, 1951.*

NUTRITION

Protein Hydrolysates in Veterinary Medicine

Although many of the earlier prescriptions were compounded and used merely because some individuals got well following their use, the modern trend is to administer drugs on the basis of the action and the effect which they exert upon the animal body. By means of isotope study, it is now possible to administer drugs containing traces of radioactive material and to follow the drug through the body to determine exactly how much of it is broken down, how much is detoxified, and how much is excreted or eliminated by other means.

In this connection, protein hydrolysate solution which contains all essential amino acids, in combination with dextrose as a source of readily available carbohydrates, is extensively used. Nitrogen or protein balance is essential to life and the maintenance of the tissues, their repair and resistance to infection. Two primary sources for this basic protein have long been recognized—casein and fibrin. Experiments have shown that fibrin hydrolysate solution is the best to be had and the following discussion is based upon the use of such a solution (aminosol,® Abbott).

Protein Therapy

Equilibrium exists between serum protein and the protein of the tissues, so that when hypoproteinemia is present, the tissues themselves are in a state of nitrogen starvation. This means that there is not only less protein to maintain the body and feed the tissues, but there is less protein available to repair the diseased or traumatized tissues as well. Fat can be synthesized from carbohydrate and carbohydrate from protein, but the animal can not fabricate protein from any class of food other than protein itself or its digestion products, the peptides and amino acids.

In the normal adult, there is a precise balance between the intake of protein nitrogen and the output of nitrogenous breakdown products such as urea, ammonia, and creatinine. A positive nitrogen balance or nitrogen retention is indirect evidence of new tissue protein synthesis in the form of cellular protoplasm, plasma protein, and hemoglobin. On the other hand, negative nitrogen balance means breakdown of body tissue proteins and this occurs during periods of inadequate dietary intake, infectious disease, and following operations. Tissue protein breakdown occurs whenever the patient receives insufficient calories to maintain the body activity. This means that the animal can not overcome important shortages of energy-producing foodstuffs merely by utilizing its own fat and gly-

TABLE I—Causes of Hypoproteinism

I) Lack of protein metabolities
- A) Inadequate diet
  - 1) Anorexia
  - 2) Senility
  - 3) Dietary restrictions (peptic ulcer)
  - 4) Esophageal, pyloric obstruction
- B) Poor absorption
  - 1) Regional enteritis and ulcerative colitis
  - 2) Enteric fistulas
  - 3) Carcinoma of stomach
  - 4) Postoperative total pancreatentomy
  - 5) Cystic fibrosis of pancreas and celiac syndrome
  - 6) Sprue

II) Excessive loss of protein metabolities
- A) Draining wounds
  - 1) Empyema
  - 2) Chronic osteomyelitis
  - 3) Decubitus ulcer
  - 4) Fungating neoplasm
  - 5) Postoperative drainage (abdominoperineal resection, mistectomy)
- B) Burns
  - 1) Acute — local edema and bleb formation
  - 2) Chronic — weeping, granulating wounds
- C) Internal losses
  - 1) Acute peritonitis, pancreatitis
  - 2) Acute intestinal obstruction
- D) Renal diseases with albuminuria
  - 1) Nephrosis
  - 2) Chronic glomerulonephritis
  - 3) Amyloidosis
- E) Increased protein breakdown for gluconeogenesis in thyrotoxicosis, pyrexia, uncontrolled diabetes, and Cushing's syndrome

III) Increased protein need
- A) Pregnancy, Lactation

IV) Metabolic dysfunction
- A) Liver disease
  - 1) Cirrhosis
  - 2) Chronic hepatitis
  - 3) Hepatorenal syndrome
- B) Carcinoma of gastrointestinal tract

Excerpts from a paper "Modern Trends in Veterinary Medicine" presented by Dr. R. H. Hollis of Abbott Laboratories at the Chicago Veterinary Medical Association meeting, Jan. 9-10, 1951.

cogen depots. It also breaks down protein. As much as 40 per cent of the protein content of a rat's liver is removed during seven days of fasting. From each 30 Gm.

TABLE 2—Manifestations of Hypoproteinism

1) Lowered resistance to blood loss; increased susceptibility to shock.
2) Lowered antibody production; lowered resistance to infection.
3) Impairment of wound healing; more frequent postoperative wound dehiscence.
4) Bone atrophy and impaired healing of fractures.
5) Liver dysfunction and fatty infiltration; increased susceptibility to liver poisons (chloroform, arsphenamine).
6) Anemia; impaired hemoglobin regeneration after venesection.
7) Diminished tissue proteins.
8) Hypoalbuminemia.
9) Diminished plasma volume (variable).
10) Increased volume of interstitial fluid compartment.
Generalized tissue edema
Edema at site of gastrointestinal anastomosis with obstruction.
Delayed gastric emptying time.
Salt intolerance.
11) Weight loss.
12) Weakness, lassitude, mental depression, pallor, low pulse rate, blood pressure, and basal metabolic rate.

of transfused plasma protein, only 1 Gm. is utilized for the correction of the plasma protein deficit, while the remainder goes to replenish the tissue protein. It is apparent, therefore, that blood or plasma will not supply sufficient protein fast enough, in a depleted patient. Moreover, depleted patients do not tolerate parenterally given saline solutions very well. Peripheral and pulmonary depletion may be treated with far greater efficiency before the operation rather than after.

Differentiation of Abnormalities

Abnormalities in fetal development and also low hatchability of eggs and livability of chicks have been quite definitely associated with specific deficiencies, and differential diagnosis from other conditions is sometimes complicated.

The alterations in reproduction from lack of vitamin A are reversible in both sexes and subsequent adequate intake results in normal reproduction. This is in contradistinction to the effects of vitamin E shortage in rats which are irreversible in the testicular germ cells, and cause the death of the fetus *in utero*. Vitamin E has been demonstrated to prevent and cure so-called stiff lamb disease, which condition may be confused with nonsuppurative arthritis in this species caused by a definite infective agent gaining access through castration and docking wounds.

In late gestation and early life, vitamin A deficiency in the bovine animal may be symptomatically quite similar to three other well-known diseases; abortion from Brucella infection, infectious keratitis, and white scours.

Calves born alive with no vitamin A storage and getting milk from depleted dams will develop a typical white scours diarrhea. It is readily controlled with vitamin A therapy. The true white scours will develop in the presence of abundant vitamin A intake and storage, and excess intake by the affected young animals will have no effect on its frequently fatal termination.

A long series of investigations have shown the need for the B factors in swine. Attempts to establish their causal relation to the widely prevalent necrotic enteritis in swine have not been successful.

All of the evidence shows that nutrition plays an important role in relation to disease during growth and development in all animal life, in metabolic disturbances in adult life and old age, particularly in man. —*From an address, "Nutrition in Relation to Disease," by Dean George H. Hart, School of Veterinary Medicine, University of California, presented at the 43rd annual convention of the American Feed Manufacturers Association, Chicago, May, 1951.*

It seems unlikely that vitamin E deficiency is involved in reproductive failures that often occur in cattle under practical conditions.—*Nutr. Rev., March, 1951.*

It is possible that herds experiencing a high incidence of ketosis are fed rations that yield larger than normal amounts of butyric acid and smaller than normal quantities of propionic acid.—*Cornell Vet., April, 1951.*

Vitamin B_{12} in relatively large doses ameliorates the effects of hepatic necrosis induced by carbon tetrachloride. The vitamin, which must be administered before the drug is given, appears to prevent accumulation of fat in liver cells and to lessen the necrotic process.—*Nutr. Rev., May, 1951.*

EDITORIAL

Survey of Physicians' Incomes Will Interest Veterinarians

The results of a survey of the 1949 incomes of physicians, recently published, show that the average (mean) net income of the 30,000 practicing physicians who returned questionnaires was $11,058 a year. This figure represents 60.4 per cent of the average (mean) gross income of $18,316.

The report of the survey, which was conducted jointly by the Office of Business Economics of the United States Department of Commerce and the American Medical Association's Bureau of Medical Economic Research, was published in the Department's July *Survey of Current Business*. The *Journal of the American Medical Association* (vol. 146, July 28, 1951) also has an editorial on the "Income of Physicians" and an article entitled "Survey of Physicians' Incomes" which gives much of the detailed data.

The results of this survey will be of particular interest to veterinarians because of a similar survey recently conducted by the Veterinary Service Committee of the AVMA, which is now almost completed. The analysis of the 3,500 completed questionnaires returned from the 6,060 veterinary practitioners to which it was mailed will provide more comprehensive information about the economics of the practice of veterinary medicine than has been known up to this time. The results of this survey will probably appear in next year's report of the Veterinary Service Committee. This year's report of the Committee, which will be published in the "Proceedings Book" of the 1951 annual meeting, includes the questionnaire which was used. The Committee also plans to make a survey of the income of veterinarians in nonpractice pursuits during the coming year.

Previously, there have been only two noteworthy attempts to survey the earnings of practicing veterinarians. The first was by the Committee on Education in 1940 and the results were published in the committee report for 1931 (the so-called "Bemis Report"). It reported figures on 417 practitioners in 11 states.

The second and more recent survey was made in 1942 by the National Income Unit of the U. S. Department of Commerce and covered the year 1941. It was reported in the Department's *Survey of Current Business* for July, 1943. Although 12,300 questionnaires were mailed to veterinarians, only 1,604 "usable" schedules were returned, or 13 per cent of the total, hardly a representative sample for statistical purposes. Hence, the better than 50 per cent response of practicing veterinarians to the Veterinary Service Committee questionnaire of 1951 is highly satisfactory and should yield truly representative results.

There were other facts and figures resulting from the survey of physicians which are of interest to veterinarians. In general, perhaps many of the figures pertaining to the medical profession will apply equally to the veterinary medical profession. The following are some of the results of the survey published in the *Journal of the American Medical Association*.

1) The median net income reported was $8,835; that is, one-half of the physicians reported net incomes of less than this amount and the other half reported higher incomes. Many statisticians regard the median income as more descriptive than the mean (average) income in such surveys.

2) The evidence is now clear that the average earnings of physicians are above those of lawyers, the reverse of the situation which prevailed one or two decades ago.

3) The average (mean) income reported by general practitioners was $8,835 as compared to $15,014 for full-time specialists.

4) The mean and median net incomes of non-salaried physicians were highest in the far west (Washington, Oregon, Nevada, and California), being $14,235 and $12,243, respectively.

5) New England ranked lowest in both mean and median incomes, which were $9,602 and $7,818, respectively.

6) The study is replete with evidence that the highest average incomes are not

being earned by physicians in large metropolitan cities.

7) In the larger sense this study demonstrates again that there was no nation-wide shortage of physicians in 1949, for physicians' incomes had risen just about as fast, percentage wise, as the average income of the American people. The mean and median net incomes in 1949 of physicians would have been far higher if there had been a nation-wide shortage of physicians. On the other hand, this study provides much evidence of the economic advantages of practicing medicine in the small and medium-sized cities and, indirectly, may suggest to some an over-supply of physicians in metropolitan centers.

The Veterinary Service Committee is confident that its survey will produce equally interesting and perhaps unsuspected facts, and we look forward to their report, parts of which will be published in the September, 1952, JOURNAL. Their full report will appear in the 1952 "Proceedings Book." All of the uses for the data which this survey of veterinarians will produce can not be foreseen, but the information will certainly be extremely valuable. The Committee is entitled to special commendation for undertaking this project. The more than 3,500 veterinary practitioners who returned questionnaires and thus made the survey successful have made a contribution to veterinary medicine which deserves the thanks of their colleagues.

A sound and inclusive poultry inspection service under veterinary supervision must be our primary bulwark in protecting both the health of the public and the integrity of one of our major sources of food.—*C. A. Brandly, D.V.M., Pub. Health Rep., May 25, 1951.*

The Veterinarian and Public Health

Public Health services with their educational and protective programs can further reduce the incidence of communicable disease and noncommunicable disability, but there will always remain a large section in the field of health to be undertaken by the practitioner of curative services. His importance in the scheme of things must be maintained if the whole field is to be fully developed. Unneeded fences should be removed. The economic barrier in obtaining necessary treatment must disappear.—*The Veterinarian and Public Health. Canad. J. Comp. Med. and Vet. Sci., June, 1951.*

Quell New Foot-and-Mouth Disease Outbreak in Mexico

Prompt eradication measures appear to have controlled a new outbreak of foot-and-mouth disease in the State of Veracruz, Mexico, according to a USDA report dated Aug. 22, 1951.

The trouble was reported early in August from the town of Nautla, which is east of Mexico City and only about 75 miles from the site of an outbreak last December. Early accounts indicated that four different herds were involved. The entire area was placed under quarantine, sick animals were slaughtered, and inspection was intensified to guard against possible further spread of the disease.

As practitioners, we should not be confused by the erratic habits of viruses. We must accept the fact that viruses have unusual ability to come and go miraculously . . . . viruses are all around us.—*M. G. Fincher, D.V.M., in Cornell Vet., April, 1951.*

All technicians (in artificial breeding work) would be well advised to stick to their job of inseminating cows. If a dairyman suggests that they make an examination or administer drugs, they owe it to their association and the farmer to suggest that a veterinarian be called.—*Hoard's Dairyman, June 25, 1951.*

The U. S. Department of Agriculture reports that scientists have produced x-disease of cattle experimentally, but as yet the agent which actually causes the disease has not been determined. This was the conclusion at a recent conference in Ithaca, N.Y., of research workers from 13 state agricultural experiment stations which are coöperating with the U.S.D.A.—*U.S.D.A. Release, Aug. 3, 1951.*

CURRENT LITERATURE

ABSTRACTS

Some Aspects of Immunity in Rinderpest

Toward the end of the nineteenth century, research workers tried to find a means of inactivating the rinderpest virus to use as an immunizing agent.

The degree and duration of the immunity conferred on vaccinated animals depend on several factors. The type of reaction in the vaccinated animals has no direct relation to the degree of immunity conferred by vaccination. Even "symptomless" reaction is often followed by solid immunity, provided the virus used was potent.

It is well known that strains of rinderpest virus recovered from the natural outbreaks are not always of the same virulence. There are strains recovered from the mild natural outbreaks that are actually milder in their effects upon cattle than are some moderately caprinized strains of the virus. There are, again, strains recovered from more virulent natural outbreaks that have devastating effects in the inoculated animals.

Goat tissue vaccine prepared in one state may not be antigenically similar to the goat tissue vaccine prepared in another state.

The author believes that the problems connected with the epidemiology should be tackled on a "zonal basis." The problems of one zone may be different from those of the other, and unless these problems are known, they can not be solved.—[*A. Mukerji: Some Aspects of Immunity in Rinderpest. The Indian Vet. J., 27, (1951): 351-355.*]

Septicemic Infections of Newborn Foals

The newborn foal is quite vulnerable to bacterial infection. Two microörganisms, *Shigella equuli* and hemolytic streptococci are responsible for the majority of infections and deaths of young foals.

Postmortem findings and mortality rates in foals, submitted to the Kentucky Agricultural Experiment Station from 1921 through 1950, are reviewed. The article includes 12 recent case reports.

The results obtained from treatment of infected foals during the 1948 and 1949 foaling seasons with streptomycin, or penicillin combined with streptomycin, indicated that the infections were satisfactorily controlled.

The results obtained from use of aureomycin for treatment of septicemic infections of newborn foals indicated that this antibiotic may prove useful for control of *Shig. equuli* infections. The response in several foals showing symptoms typical of this infection was dramatic. Clinical improvement was apparent within twelve to fifteen hours and foals often were up and nursing within twenty-four to forty-eight hours after treatment was initiated.

The efficiency of the antibiotics, aureomycin, streptomycin, and penicillin, for control of infections of young foals, was readily demonstrated in comparing mortality records of foals submitted for postmortem examination.—[*E. R. Doll and W. R. McGee: Septicemic Infections of Newborn Foals. Vet. Med., 4, (1951): 123-127.*]

Test for Dirofilaria Immitis

There is definite need for an accurate, practical diagnostic procedure which will simplify routine testing for microfilaria of the dog heartworm, *Dirofilaria immitis*.

A technique for examining peripheral blood for microfilaria by use of the solution filtest is described.

Ninety-one dogs were tested with this solution for the purpose of diagnosing filarial infection and 8 (8.7%) positive cases were found.

The whole blood smear technique was employed in 48 tests made on dogs known to have microfilaria in the peripheral blood. In 14 (29%) instances, failure to demonstrate the parasite was recorded. Examinations on the same dogs at the same time using filtest solution were positive for microfilaria in every instance.—[*G. R. Burch and H. E. Blair: A Rapid Test for the Diagnosis of Dirofilaria Immitis. Vet. Med., 4, (1951): 128-130.*]

Inherited Immunity

Passive immunity of homologous type is transmitted from mother to offspring (a) in man, apes, and rodents predominantly via the placenta (or other intrauterine mechanism); and (b) in sheep, goats, cows, horses, and pigs via the colostrum, which may be rich in antibodies and is absorbed rapidly by the newborn animal.

Antibodies are not invariably beneficial, and their interaction with the corresponding antigens may cause disease or death of the fetus. One aspect of this problem is the transmission of Rh antibodies.

The mother of a child with erythroblastosis fetalis, or hemolytic disease of the newborn, is nearly always Rh-negative. The father and the child itself are Rh-positive. The mechanism by which the disease is produced appears to be that small quantities of fetal blood containing the Rh

antigen escape through the placenta (which may show a local lesion of the villi) into the maternal circulation and produce iso-immunization of the mother. Antibodies are produced in her serum, which pass back into the fetal circulation. Antigen-antibody reactions then take place between these antibodies and the Rh substance in the infant's red cells and possibly other tissue cells. This is one instance in which the permeability of the placenta to antibodies is certainly not a protective mechanism.

Iso-immunization of pregnancy, leading to jaundice or other manifestations of the syndrome of hemolytic disease, has been observed in horses, mules, and dogs.

Different animal species show an inborn racial immunity, or nonsusceptibility, to various infecting agents.

Congenital immunity is acquired by the passive transfer of antibodies made in the mother to her offspring, either via the placenta (or other form of intrauterine transmission) or via the colostrum.

There is a correlation between the transfer of antibodies and that of *gamma* globulin.

Transference through the placenta, after passive immunization of the mother, occurs more readily with homologous than with heterologous antitoxins.

It is widely held that the active responses of very young animals to injected antigens are relatively unsatisfactory owing to immaturity of the antibody-producing mechanism.—[*H. J. Parish: Inherited Immunity. Brit. Med. J., No. 4716, (1951): 1164-1168.*]

A New Coccidium Pathogenic for Turkeys

In the course of this work, 35 samples of intestines or droppings from turkeys were examined from several New York farms. An examination of oöcysts derived from one of these samples prompted the authors to investigate the possibility that an undescribed species might be present. It should be noted that the 20-week-old turkeys from which this sample was obtained had no symptoms of clinical coccidiosis.

A new species of Coccidium of the turkey, named *Eimeria adenoeides*, was isolated and identified by single-cell technique.

The development of this species occurs in the lower part of the ileum, cecum, and rectum. It not only affects the superficial epithelium of the tips of the villi but also the mucosa of the crypts and deep glands. The site of infection is in the mucosa of the deep glands, which serves to distinguish it from the other previously described species.

Infected poults pass droppings that are quite fluid and may be blood-tinged. The cecum may contain caseous cores. The gross pathology produced by infection with *E. adenoeides* will not serve as a criterion for differentiating it from infections with other species.

Eimeria adenoeides is highly pathogenic for poults under 6 weeks of age. It is possible to kill 100 per cent of experimental poults up to 5 weeks of age with large doses of sporulated oöcysts. Older poults develop a severe enteritis accompanied by little or no mortality. *Eimeria adenoeides* is the most pathogenic of the known ellipsoidal species of coccidia that infect turkeys. Attempts to infect chickens, guinea fowl, pheasants, and quail failed.—[*Earl N. Moore and J. A. Brown: A New Coccidium Pathogenic for Turkeys, Eimeria Adenoeides N. Sp. (Protozoa: Eimeriidae). Cornell Vet., 41, (1951): 124-135.*]

Studies in Pullorum Disease

Studies of artificial infection of turkeys with regular, variant, and mixed form cultures of *Salmonella pullorum* were conducted.

Mortality, agglutinin response, and number infected at the end of the experiment in three groups of day-old poults infected with regular, variant, and mixed forms of *S. pullorum* were similar.

Agglutination tests with whole blood and tube methods showed a disagreement of 10 per cent on total reactions. *Salmonella pullorum* was isolated from 2 males which were negative by both methods at time of slaughter. Both had shown reactions on earlier tests.—[*Ronald Gwatkin and Lucija Dzenis: Studies in Pullorum Disease. Canad. J. Comp. Med. Vet. Sci., 15, (1951): 108-119.*]

Effect of Fluorine on Swine Teeth

This report is the result of a surprise finding of hypoplastic lesions in the enamel of the developing teeth of some swine that were being studied as "normal" animals. The discovery of developmental defects in well-bred swine that had been raised under ideal conditions pertinent to nutritional experimentation gave emphasis to the desire to find the cause for these lesions. The animals were raised on a series of high-quality rations. An examination of the rations, for the purpose of finding possible toxic substances, led to a consideration of distillers' solubles which made up 10 per cent of the diet of 5 animals. It is the practice of many large distilleries to incorporate fluorine ($NH_4F \cdot HF$) into the mash during the brewing process. The fluorine remains in the residue or "slops." These by-products of distillation frequently are used to supplement basal rations fed to livestock.

The swine obtained for this study were 26 to 29½ weeks old, 206 to 225 lb. in live weight, and were equally divided between the sexes.

The distillers' soluble component of the rations was analyzed for fluorine. Many studies reported in the literature have shown that teeth and bones are subject to developmental changes. It is believed that these observations should be reported as specific cases wherein fluorine in the diet may be a factor. Nutritionists and stock raisers should be informed of the possibility of fluorine being present in feed supplements in quantities approach-

ing a toxic level.—[*James A. English: The Effect of Distillers' Solubles Containing Fluorine on the Development of Dental Enamel in Swine's Teeth. Science, 113, (1951): 678-680.*]

Structural and Insecticidal Relationships in Rotenone, Methoxychlor, and DDT

A marked parallelism in specificity of insecticidal action, as well as in structure, is noted among rotenone, methoxychlor, and DDT. This similarity is shown by testing the insecticides simultaneously under identical test conditions.

A comparison of the toxicity of rotenone, methoxychlor, and DDT to 4 representative agricultural pests was made. These compounds display a marked similarity in that they are toxic to the same species of insects and ineffective against the same species.—[*R. W. Hummer and E. E. Kenaga: Structural and Insecticidal Relationships in Rotenone, Methoxychlor, and DDT. Science, 113, (1951): 653-654.*]

Eosinophile Count in Cyclotron Workers

Several workers have reported eosinophilia in response to x-ray and radium exposure.

This report is based upon observation of 3 workers who received an indeterminate exposure while sanding the copper dees of a cyclotron.

It is suggested that the total circulating eosinophile count may be a useful indication of exposure to radiation in individuals employed in x-ray, cyclotron, and other laboratories with radiation hazards.—[*Campbell Moses and Madeline Platt: Changes in the Total Circulating Eosinophile Count in Cyclotron Workers. Science, 113, (1951): 676.*]

Provocation of Masked Swine Influenza Virus

The author recalled that human influenza virus administered intranasally to normal swine induced infection and that the human virus could be transferred serially in swine for at least five passages without antigenic change. There was no suggestion that serial passage of human influenza virus through swine converted it to swine influenza virus or altered its antigenicity. The human influenza virus appeared to "breed true" even in a host that was known to have an influenza virus of its own.

In a second observation, it was found that human influenza virus intranasally applied to swine that were carriers of masked swine influenza virus elicited an infection in which influenza appeared to play the leading etiological role. In such infections, only swine influenza virus could be recovered from the respiratory tracts of infected swine despite the fact that the human agent served in initiating the infecting process. The only evidence indicating that human influenza virus played any etiological role was the appearance of neutralizing antibodies for the human agent in the blood serums of convalescent swine. The most likely explanation of this observation is that the human influenza virus infection in some way provoked to infectivity the masked swine influenza virus present in the lungworms infecting the swine respiratory tracts. It seems likely that a large amount of masked swine influenza virus must have been present and that this was rather rapidly converted to fully infective virus by the mechanism initiated by the human virus infection, perhaps even before the human virus had multiplied or invaded the respiratory tract extensively.

If, in addition to interference between large amounts of swine influenza virus and small amounts of the human agent, the swine respiratory tract should actually favor the multiplication of swine type virus, the chances of demonstrating the human agent would be lessened even more. It is apparent that swine infected with lungworms carrying masked influenza virus react differently than do normal swine to infection with human influenza virus. The latter come down with an influenza that, so far as can be told, is caused by the strain of human virus with which they were inoculated, and this virus breeds antigenically true on serial transmission through normal swine. The former come down with an influenza in which the causative virus appears antigenically distinct from the virus with which the animals were inoculated. By all tests which can be applied, the starting virus completely disappears, even as early as the second day. The swine influenza virus recovered from such animals during the course of their illness, as well as that responsible for the swine influenza virus neutralizing antibodies in their blood serum after recovery, is believed to be masked virus that has been provoked to infectivity by the human influenza virus infection.

The observations presented indicate that, theoretically at least, under conditions duplicating the situations existing in these experiments, an influenza virus of one serological type spreading through a population in which certain individuals are infected with masked or latent virus of another serological type might result in the genesis of an epidemic virus of the second serological type.

In concluding, the findings are interpreted as indicating that masked swine influenza virus was provoked to infectivity by the infection of "prepared" swine with human influenza virus. Despite the fact that known active human influenza virus was used, swine influenza virus could be demonstrated in the respiratory tracts and lungworms of the swine in which infections were provoked. Such animals, however, had neutralizing antibodies for both swine and human influenza virus in their blood serum during convalescence.—[*R. E. Shope: Provocation of Masked Swine Influenza Virus by Infection with Human Influenza Virus. Tijdschr. voor Diergeneesk., 76, (1951): 414-420.*]—L. V. E.

Virus Disease of Swine in Japan

An acute infection with 100 per cent morbidity

occurred among young swine. There was high fever, depression, and weight loss. When the infection was complicated by *Salmonella suipestifer* infection, death ensued. Surviving animals failed to grow well. A virus was isolated which was transmissable only to guinea pigs and rabbits in which it produced only a transitory rise in temperature.—[*Y. Ochi and K. Miyairi: Studies on the Third Virus Disease of Swine. I. The Isolation of Virus and Its Characteristics. Jap. J. Vet. Sci., 5, (1943): 305.*]—A.G.K.

Relations Between Allergy and Immunity

Immunity is considered as a part of allergy. As a consequence of a natural or artificial infection or injection of microbial substances (for immunization) the animal organism is altered, and the defense reactions are increased and intensified. This is demonstrated by hyperergic reactions after a further contact with the homologous antigen, and finally there are no visible reactions at all—the state of complete immunity in all tissues. These ideas are based on the experiment of R. Koch and further experiences with blackleg and tuberculosis.—[*E. Saxer: The Relations Between Allergy and Immunity. Schweiz. Arch. f Tierheilk., 93, (1951): 239.*]—F. KRAL.

Pathology of the Ruminant Forestomachs

The various pathologic-anatomic lesions of the forestomachs of ruminants are described, such as: perforations, foot-and-mouth disease, rinderpest, tuberculosis, infections with *Bacillus* necrophorus, and tympany.

The glandless cornified mucosa protects, to a certain extent, against chemical and physical damaging influences. The etiological diagnosis must rely upon functional correlations.—[*H. Stunzi: Pathology of the Ruminant Forestomachs. Schweiz. Arch. f Tierheilk., 93, (1951): 28.*]—F. KRAL.

Sewage and Newcastle Disease

After ingestion of feed contaminated by the feces of chickens suffering from Newcastle disease, the fecal matter may remain contagious for three to five days. The water of open drains to which fecal matter of infected fowl had been added at the rate of 1:1,000 caused the death of chickens after five days. Poultry establishments may become infected by visiting or passing wild birds.—[*T. C. Kraneveld and Mob. Mansjoer: Sewage and Newcastle Disease. Hemera Zoa, 57, (1950): 166-170.*]—L.V.E.

Teat Lesions and Mastitis

The author submits a survey of the anatomy and the histology of the bovine teat. He discusses experiments which control the part played by the teat in the prevention of mastitis. His observations include a number of teats from infected udders. Most of these teats presented a cysternal mucosa with important pathological changes: diffuse thickening, miliary proliferation, ulceration, papillary changes, etc. The author discusses the question whether these lesions are primary or secondary mastitis.—[*G. Standaert: Teat Lesions and Mastitis. Vlaams Diergeneesk. Tijdschr., 20, (1951): 73-81.*]—L.V.E.

Salmonellosis in Man

The author describes a case of salmonellosis infection in man caused by the consumption of an insufficiently cooked infected chicken egg. The causative microörganism proved to be *Salmonella typhimurium* var. *copenhagen*. The cultural biochemic character, as well as the isolated type, is described in the original publication. The author points to the need of sanitary control of the traffic in eggs.—[*Mob Mansjoer: Salmonellosis in Man (II). Hemera Zoa, 58, (1951): 254-258.*]—L. V. E.

Acetonemia Therapy

The author mentioned that in 8 of 9 cases of acetonemia in milk cows, potassium chloride proved unsuccessful when given by the mouth in quantities of 40 Gm. a day for four successive days. From these results and from numerous other experiments, evidence showed that not the potassium ions but the chloride ions bring about the therapeutic action in acetonemia in milk cows.—[*D. Talsma: On Acetonemia Therapy. Tijdschr. voor Diergeneesk., 76, (1951): 408.*]—L.V.E.

Peritonitis of the Oviduct in Hens

From 24 of 45 cases of peritonitis in hens, pure cultures of a gram-negative nonsporeforming rod identical to cultures isolated from the cloaca of normal hens were recovered. Bacteriologically, it appeared to fall into the genus Shigella. It was pathogenic for mice, guinea pigs, and chickens.—[*Bjorn Kjos-Hanssen: Peritonitis of the Oviduct in Hens Caused by Pathogenic "Cloaca Bacteria" (title trans.). Nord. Vet.-med., 2, (1950): 523-531.*]—A.G.K.

Etiology of Puerperal Acetonemia

In acetonemia and in some cases of puerperal paresis, the blood level of potassium is lower than in normal cows, which indicates that primary acetonemia is due to hypofunction of the adrenal cortex. Cases of acetonemia were beneficially treated with KCL and adrenal cortical extracts.—[*Birger Carlstrom and Nils Carlstrom: The Etiology of Puerperal Acetonemia (title trans.). Nord. Vet.-med., 2, (1950): 581-590.*]—A.G.K.

In Vitro Effect of Antibiotics on Mastitis Bacteria

Fifty strains were tested. A concentration of chloromycetin of 0.033 mg. per milliliter inhibited growth for twenty-four hours and 0.95 mg. per milliliter was effective for seventy-two hours. Aureomycin inhibited growth for seventy-two

hours in concentrations of 0.167 mg. per milliliter. Streptomycin inhibited growth of 90 per cent of the strains for seventy-two hours in a concentration of 0.33 mg. per milliliter.—[*C—H. Klatt and H. Westermarck: The Effect of Chloromycetin, Aureomycin, and of Streptomycin in Vitro on Strains of Escherichia Coli from Mastitis (title trans.). Nord. Vet.-med., 2, (1950): 916-925.*]—A.G.K.

BOOKS AND REPORTS

Mink in Health and Disease

Mink have never brought higher prices than at present, which is the same as saying that never has their culture been more remunerative, or a book more timely than Dr. Kennedy's compact volume. The situation is not likely to change, because mink flatters the fair. Some furs can be worn by only a few, but any woman can visualize herself in mink. Now there are shades and varieties to suit all tastes. The breeding chart is hardly less complicated than the blueprint of a battleship, but there is money to be made by the rancher who can comprehend and use it. Bits and pieces of Dr. Kennedy's work have appeared in the *Fur Trade Journal* before, but here is a really worth-while reference and guide on the ailments of mink, put together as a series of essays, which cover the various disturbing manifestations that a rancher is likely to encounter.

A number of the conditions described arise from nutritional difficulties, and the author is quick to point out that fundamental information on mink nutrition has yet to be gathered. Each instance described is the product of experience isolated or multiplied in relation to the extent to which the causative food condition is likely to occur. Virus and virus-like infections produce a further baffling series of mink diseases. The inoculations which can bring mink distemper under complete control are fully described.

Parasitic infections are of comparatively minor importance under ranch conditions. Bacterial infections, of which Klebsiella, Salmonella, and hemolytic streptococci are most important, are widespread and call for intelligent observance of proper sanitation. The animals are also subject to pneumonia and a number of other infections. A variety of conditions arise from the handling of food and the manner in which the animals are kept, and there is the usual list of abnormalities, genetical and otherwise. Where major nutritional problems remain unsolved, other troubles multiply. Veterinarians as well as ranchers will be grateful to Dr. Kennedy and agree that the growing contribution of the mink to the economic well-being of the country justifies intensive research on the fundamental problems of mink ranching.—[*The Mink in Health and Disease. By A. H. Kennedy. Cloth. 307 pages. Published by Fur Trade Journal of Canada, Toronto. 1951. Price $6.50.*]

Restraint of Animals

This small book of 235 pages is one of the best to appear in the field of veterinary practice for many years. It takes up in detail the many ways in which animals can be restrained for examination, surgery, or the giving of medicine. The descriptions are clear and lucid, yet brief. The line drawings on nearly every page are excellent and supplement the text so well that the reader can grasp the technique of any procedure at a glance. The book begins with a short description of the most important rope splices, knots, and hitches. It then proceeds with restraint of the horse, from the use of the twitch up to complete restraint by casting and tying. Control of the cow is next discussed, followed by methods of handling swine. Various means used on dogs and cats, including methods of dosing with both liquids and solids, are next considered, as are the various measures by which these animals can be prevented from injuring themselves by biting or scratching.

How to catch, hold, and handle the fox, mink, and rabbit come next, and finally there is a similar discussion on chickens, turkeys, and other birds. There is no other place in the English language where all this information is available in one book. In the opinion of the reviewer, every practitioner of veterinary medicine should have a copy of this book, and every student of veterinary medicine should be required to possess one as he enters the college clinic.—[*Restraint of Animals. By John R. Leahy and Pat Barrow. Paper. 235 pages. Leahy and Barrow, Ithaca, N. Y. 1951. Price $3.50.*]

Annual Review of Biochemistry

This text is a standard in the field of biology. It is well written and contains a vast store of information. A rather careful study of its contents would be of great value to many veterinarians, especially those interested in doing some laboratory work.

The book contains all of the pertinent information regarding chemistry of carbohydrates, fats, and proteins, and anyone interested in nutrition can find valuable information regarding general metabolic chemistry. The text contains the latest information on many subjects that are related to veterinary physiology, and of particular interest are the chapters on biochemistry of cancer and immunochemistry. This is certainly a new approach to many perplexing problems of infections and their results.

The chapter that possibly will create the greatest interest is "Biochemical Genetics." We have always approached this problem as a subject separate and apart from the other sciences and now the authors show that many of the so-called unknown are explained from a biochemical viewpoint.

The text is good, the authors are well qualified,

and practitioners of veterinary medicine can get a great deal from it. It is a book of great interest and specific information to anyone interested in the biological field.—[*Annual Review of Biochemistry. Edited by J. Murray Luck (editor), and Hubert S. Loring and Gordon MacKinney (assoc. editors). Cloth. 648 pages. Annual Reviews, Inc., Stanford, Calif. 1951. Price $6.00.*]

Internal Diseases of Domestic Animals

This is the fourth edition of the well-known Marek's "Clinical Diagnoses of Internal Diseases of Domestic Animals." The general arrangement of the clinical examination of domestic animals has remained the same as in previous editions. The examination on percussion, auscultation, rectal examination, and many other chapters offer a clear explanation of these important physical methods.

In this edition, a completely new chapter has been added explaining the diagnosis of disorders of the autonomic nervous system and of metabolism. The diagnosis of traumatic gastritis in cattle, as well as the gastric activity in carnivorous animals, kidney function test, examination of spermatozoa, examination for pregnancy, and the exploratory puncturing of the spinal canal have been discussed in more detail.

This classical textbook of clinical diagnosis is an excellent contribution to veterinary medicine. —[*Lehrbuch Der Klinischen Diagnostik Der Inneren Krankheiten Der Haustiere: By J. Marek and J. Mocsy. 4th ed. 630 pages. 551 illustrations. Gustav Fischer, Jena. 1951. Price not given.*]—F. K.

Diseases of Horses

This booklet is one of a group of Reinhardt's writings on the fundamentals of veterinary medicine. It reviews, in a compact and easily understandable form, the skin, internal, nervous, infectious, and parasitic diseases of horses.

The manual is well organized, especially the charts which aid in distinguishing the differential diagnosis, and is accompanied by 60 simple but instructive illustrations. It is a general instructive work of the most common internal equine diseases which may be useful as a quick review to veterinary students as well as practitioners.—[*Grundriss der Innere Krankheiten Des Pferdes. By Werner Steck, Dr. med. vet. 166 pages. Ernst Reinhardt Verlag, Basel, Switzerland. 1951. Price 9.80 swiss franks.*]—F. K.

Methods in Medical Research

This is the fourth of a proposed series of five volumes, all having the same title but dealing with the methodology of various specialized medical research problems. Since most scientific medical journals relegate methodology to areas of finer print, footnotes, or often request abbreviation to the point of uselessness, the beginner in medical research wastes time and effort in experimenting before he is ready to repeat the work of established scientists. Often he fails; frequently he insists that former work was in error, only to discover through experience that the error was his. Still, the novice is the scientist of the future. Why shouldn't he be given every conceivable bit of assistance that present-day established research workers can give him? This and the preceding three volumes are designed to make available complete and detailed methods used by outstanding and established scientists of today.

Volume IV ($7.00) contains four sections: Section 1—Histochemical Staining Methods, associate editor, George Gomori; Section 2—Fluid and Electrolyte Distribution, associate editor, Louis B. Flexner; Section 3—Studies on Gastrointestinal Pressures, Innervation and Secretions, associate editor, J. P. Quigley; and Section 4—Tissue Culture Methods, associate editor, C. M. Pomerat.

It is difficult to review this book without calling attention to previous volumes.

Volume I ($8.00), edited by Van R. Potter and appearing in 1948, contains the following: Section 1—Assay of Antibiotics, associate editor, Henry Welch; Section 2—Circulation: Blood Flow and Measurement, associate editor, Harold D. Green; Section 3—Selected Methods in Gastroenterological Research, associate editor, A. C. Ivy; and Section 4—Cellular Respiration, associate editor, Van R. Potter.

Volume II ($6.50), edited by Julius H. Comroe, Jr., and appearing in 1950, contains the following: Section 1—Methods of Study of Bacterial Viruses, associate editor, Mark H. Adams; Section 2—Pulmonary Function Tests, associate editor, Julius H. Comroe, Jr.; and Section 3—Assay of Hormonal Secretions, associate editor, Eleanor H. Venning.

Volume III ($7.00), edited by Ralph W. Gerard and also appearing in 1950, contains the following: Section 1—Genetics of Micro-organisms, associate editor, S. E. Luria; Section 2—Assay of Neurohumors, associate editor, J. H. Gaddum; Section 3—Selected Psychomotor Measurement Methods, associate editor, Walter R. Miles; and Section 4—Methods for Study of Peptide Structure, associate editor, Choh Hao Li.

Volume V will be edited by A. C. Corcoran and is to appear early in 1952. It will contain the following: Section 1—Immunologic Criteria for Purity of Proteins and Polysaccharides, associate editor, Melvin Cohn; and Section 2—Methods of Renal Physiology, associate editor, A. C. Corcoran; Separation of Nitrogenous Substances, associate editor, Lyman C. Craig.

The idea for bringing these volumes into existence was inspirational. They should be extraordinarily useful and valuable to everyone engaged in medical research. The beginner in medical research should progress more rapidly with these volumes at his disposal.—[*Methods in Medical Research: By Maurice B. Visscher, Editor-in-Chief. 306 pages. The Year Book Publishers, Inc., 200 East Illinois Street, Chicago 11. 1951. Price $7.00.*]

THE NEWS

Late News About the First Pan American Conference on Veterinary Medicine, Lima, Peru October 20-26, 1951

Recent advices from Dr. José Santivañez Morales, president of the Organizing Committee of the First Pan American Conference on Veterinary Medicine, give encouraging news about the good representation that is expected to attend from various countries and take part in the sessions which will be held in connection with the four-hundredth anniversary of the University of San Marcos. The dates of the Conference are Oct. 20-26, 1951, and it will be held in Lima, Peru, the site of this oldest university in the Western Hemisphere and one of its newest veterinary schools.

The JOURNAL has given previous information about the comprehensive program of the Conference (February, p. 133, and April, pp. 266-267). Needless to say, a most cordial welcome awaits all veterinarians who can take this opportunity to hear at first hand about the major animal disease problems having important relationships to the economy and public health of countries in the Western Hemisphere, the control work in progress on these diseases, as well as their research phases. In addition, veterinary educational facilities as they exist and may be developed to meet future needs will be discussed, as will factors affecting animal production, since in many Latin American and South American countries, persons with training in veterinary science are in charge of the over-all programs in animal husbandry.

MANY COUNTRIES TO SEND DELEGATES

Dr. Santivañez reports that practically every country in the Western Hemisphere has already designated one or more official representatives, many of whom will be program participants. In addition, it is expected that there will be sizable delegations of veterinarians from neighboring or nearby countries.

Present indications are that the United States will have about 10 to 15 delegates, most of whom will take part in the program. Among these are Drs. B. T. Simms, U. S. Bureau of Animal Industry; W. A. Hagan and P. P. Levine of Cornell University; I. D. Wilson, Virginia Polytechnic Institute; B. D. Blood, E. Eichhorn, and A. Zeissig of the Pan American Sanitary Bureau; Donald Baker, Institute of Inter-American Affairs, now in Paraguay; and Dr. J. L. Lush, professor of animal husbandry, Iowa State College.

Dr. J. G. Hardenbergh, executive secretary, has been named as the official delegate of the AVMA, Dr. Santivañez having especially invited participation from this source in anticipation that the Peru Conference will lead to the formal organization of some sort of Pan American Veterinary Medical Association to carry on future conferences or congresses of this sort. There is no doubt that much good could be accomplished in the Western Hemisphere by some organization or affiliation of veterinary medical groups and, particularly, the associations representing the profession in the respective countries. Such an organization could serve in an important degree to supplement the programs in animal disease control which are now carried on by official agencies and which are little known to the rank and file of veterinarians in many "good-neighbor" areas.

VACATION AND SIGHTSEEING POSSIBILITIES OF TRIP TO PERU

Although a leisurely trip can be made to Lima by boat in two weeks, it is likely that most persons attending the Conference will travel by air to save time and make possible more sightseeing before and after the meeting. Almost any airline can give or obtain information and some of them have attractively priced "package" tours to Peru and other South American countries.

Lima has many hotels, a number of them excellent and conveniently located. Sightseeing attractions in Lima and its surroundings are numerous, and visitors from the States will be intrigued by the entertainment features offered in the city.

In October, it will be spring in Peru, and one should prepare to dress accordingly. Warm clothes will be needed for mountain trips, however; beachwear can be used at Lima's many ocean beaches.

Persons in the States who plan to attend this First Pan American Conference on Veterinary Medicine and who have not yet made local arrangements in Lima should write, *air mail*, or cable Dr. Santivañez whose address is: Dr. José Santivañez Morales, President, Organizing Committee, First Pan American Conference on Veterinary Medicine, San Marcos University, Lima, Peru.

American Association for the Advancement of Science

The 118th meeting of the American Association for the Advancement of Science, to be held Dec. 26-31, 1951, will include programs of all 18 of the Association's sections and approximately 45 participating societies. Focus of the approximately 225 sessions will be Convention Hall, adjacent to the University of Pennsylvania's School of Medicine and its associated hospitals. Some meetings will be held in downtown hotels.

The sectional programs will include 11 sessions on chemistry; two symposiums on zoölogical sciences; a four-session symposium on abnormalities of lipid metabolism; three sessions, including a symposium, on dentistry; six sessions on pharmacy; and a four-session symposium on public health aspects of soil science.

The following societies will also present programs: Oak Ridge Institute of Nuclear Studies, American Society of Protozoologists, American Society of Zoologists, Herpetologists League, Society of Systemic Zoology, American Microscopical Society, Biometric Society (eastern North American region), Society for Research in Child Development and AAAS Section N, Alpha Epsilon Delta Premedical Honor Society, and the American Industrial Hygiene Association.

Registration fees are $2.00 for members of the AAAS, spouses, and bona fide students; $3.00 for nonmembers. Advance registrants pay 25 cents more but receive the general program early in December.

Status of GI Educational Program

On July 25, 1951, the cut-off date for beginning training under the government-sponsored program for education of veterans, more than 12½ billion dollars had been spent on tuition, books, and living expenses for 7,500,000 World War II veterans.

In 1947, there were 58,450 students in medicine and related courses; in 1950, there were 35,934. With an average fee of $600 annually for medical school and $75 monthly for subsistance, the Veterans Administration paid approximately $8,500,000 for students of medicine and surgery in 1950.

Veterans who have completed premedical training and are waiting admission to medical school are exempt from the July 25 cut-off date. A bill has been drafted to continue privileges of the educational program for veterans of the Korean war.

Military Surgeons To Convene in Chicago

The fifty-eighth annual convention of the Association of Military Surgeons of the United States will be held at the Palmer House in Chicago, Oct. 8-10, 1951. Members of allied medical services, such as veterinary medicine, dentistry, and nursing, will participate in the sessions. Brigadier General J. A. McCallam, U. S. Army, is president of the Section on Veterinary Medicine.

International Women's Auxiliary Introduces "The Bulletin"

A copy of *The Bulletin* (summer, 1951), the official organ of the International Women's Auxiliary to the Veterinary Profession, has been received from Mrs. A. E. Bott, Belleville, Ill., president of the organization, and editor of *The Bulletin*.

In its eight pages are pictures of wives of veterinarians in Norway, Cuba, Peru, Chile, Uruguay, Brazil, Mexico, and the United States. Also included is the picture of the family of a Japanese veterinarian in Tokyo. Among other interesting items are messages from the wives of veterinarians in Scotland, England, Australia, Scandinavia, Cuba, Chile, Japan, Uruguay, Mexico, Brazil, the United States, New Zealand, and the Philippines. An invitation from Dr. Axel Isaksson of Stockholm, secretary general of the Fifteenth International Veterinary Congress Organizing Committee, to the International Auxiliary to participate in the Congress which is to be held in Stockholm in 1953 is also published.

We reprint here the rules and purposes of the International Auxiliary, as they appear in *The Bulletin*.

RULES AND PURPOSES
International Women's Auxiliary to the Veterinary Profession

In the countries of the world where veterinarians are organized on a national basis, and in other areas less formally organized, there is a distinct service to be performed by a federation of veterinarians' wives, mothers, daughters, and women veterinarians. A strength which always results from conscientious coöperation will be realized.

The purpose of this women's federation shall be to make uniform a more helpful public understanding of the life work of the veterinarian. This united understanding can be welded into a strong bond for helping make possible the world peace that is hard to achieve. The scientific knowledge and professional talents of veterinarians raise the standards of living and health wherever applied. The organized help of their women-folk will hold ties of friendship.

The Auxiliary is to be presided over by a president and four vice-presidents, all working for the development and maintenance of this organization. Each officer will contact and work with local committees in the five established zones. All information for the furthering of the organization is to be reported to the president, and in turn it will be passed on to all organized groups. This set of officers will be responsive to any new groups and to those already established. It will be considered important to keep all countries where women are organized informed on all international activities.

The five presiding officers are to serve for four years. There will be an election of officers to carry on the organization at each International {veterinary} Congress. Any president who is unable to attend this meeting may appoint a presiding officer from the group of vice-presidents. Any vice-president unable to attend the meeting may appoint

an alternate to serve in her place on the Board at this meeting. The Executive Board will work in conjunction with the women's local committee, appointed by the International Congress. Time will be scheduled to bring all visiting women together under the leadership of this organization for social and organizational advantages during the meeting of the Congress.

The promotion and development of an International Women's Auxiliary to the Veterinary Profession shall recognize, in a coöperative way, the place and influence of the women of today. Circling the world as friends can be most helpful to further the great accomplishments of applied veterinary science.

WOMEN'S AUXILIARY

The Auxiliary Meeting in Milwaukee.—The Women's Auxiliary to the AVMA had one of its most successful meetings in Milwaukee, with 37 states, Cuba, 11 regional, and 8 junior auxiliaries represented in its House of Representatives.

The cordial hospitality and friendliness of the Wisconsin Auxiliary members, and especially of Mrs. E. A. Woelffer, chairman, and co-chairmen, Mrs. C. A. Brandly and Mrs. F. W. Milke, who, with their committees planned and worked so untiringly, made this a memorable meeting.

A friendly atmosphere prevailed at both the tea and reception and the Auxiliary luncheon which attracted record crowds—750 attended the tea and 803 the luncheon. Among the other highlights for women at the annual meeting were the style show, the tours offered by the various industries of Milwaukee, the *gemütlichkeit*, and "veterinarians' day" at the Wisconsin State Fair.

The teenagers (two bus loads of them) were entertained with a tour through Milwaukee's famous Washington Zoo, a lecture tour of the Museum, a day of sightseeing, and a splash party.

New officers for the coming year (*see* picture) were elected at the meeting of the House of Representatives. The business aspects of the Women's Auxiliary meeting will be reviewed in the November JOURNAL of the AVMA.

s/MRS. C. E. BILD, *President.*

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Maine Auxiliary.—The summer meeting of the Women's Auxiliary to the Maine Veterinary Medical Association was held at the Hotel Samoset, Rockland, on July 11. After an enjoyable social afternoon, President Mrs. L. B. Denton called the business meeting to order with 17 members and 5 guests present.

Mrs. A. E. Coombs, Skowhegan, reported on national Auxiliary affairs, and the women's program for the national convention at Milwaukee was read. Mrs. Charles Place, Dover, told of a box lunch sale which their auxiliary sponsored. A guest, Mrs. Pauline Gardiner, Auburn, spoke briefly about the Women's Aux-

Officers of the Women's Auxiliary to the AVMA for 1951-1952

Elected at the Milwaukee Meeting

Front row, left to right—Mrs. Charles C. Rife, Atlanta, Ga., treasurer; Mrs. H. S. MacDonald, Toronto, Ont., president-elect; Mrs. C. E. Bild, Miami, Fla., president; Mrs. Russell A. Runnells, East Lansing, Mich., first vice-president; Mrs. C. M. Rodgers, Blandinsville, Ill., secretary. Back row—Mrs. L. R. Richardson, Ravenna, Ohio, second vice-president; Mrs. Earl N. Moore, Trumansburg, N. Y., third vice-president; Mrs. A. E. Coombs, Skowhegan, Maine, chairman, House of Representatives; Mrs. Lewis H. Moe, Stillwater, Okla., recorder, House of Representatives; Mrs. Dennis Coughlin, Topeka, Kansas, ex officio.

iliary to the Student Chapter of the AVMA at the University of Pennsylvania of which she was a member, and told about their fancy work project to raise money for their group.

The meeting was adjourned for dinner and the evening program which included two professional films and a talk on Japan by Dr. Donald Bush.

s/(MRS. STANFORD) EVELYN H. MERRILL, *Secretary.*

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Michiana Auxiliary.—The Women's Auxiliary to the Michiana Veterinary Medical Association entertained approximately 100 members of the Association and their families at the annual picnic at the Conservation Club House at Fish Lake on July 29, 1951. After dinner, swimming was enjoyed at the beach of Dr. M. Weldy's cottage. Mrs. Roy Wescott planned games and contests for all ages after the swimming.

s/(MRS. D. L.) HELEN W. MILLER, *Secretary.*

APPLICATIONS

The listing of applicants conforms to the requirements of the Administrative By-Laws—Article X.

First Listing

BITTEL, ROBERT E.
Star Rt., Hudson, Ohio.
D.V.M., Ohio State University, 1938.
Voucher: F. J. Kingma.

BOWMAN, BERNARD
West Park St., Lebanon, Ohio.
D.V.M., Ohio State University, 1944.
Voucher: F. J. Kingma.

BUEHLER, H. J.
520 Flamingo Drive, West Palm Beach, Fla.
D.V.M., Michigan State College, 1929.
Voucher: V. L. Bruns.

COMSTOCK, WARREN JOHN
Knight Hill Road, Clayville, R. I.
D.V.M., United States College of Veterinary Surgeons, 1926.
Voucher: J. T. Barber.

EASH, ALDEN T.
Greensboro, Md.
D.V.M., Michigan State College, 1938.
Voucher: John D. Gadd.

GINGRICH, S. W.
Baraga, Mich.
D.V.M., Michigan State College, 1923.
Voucher: R. A. Runnells.

HENAGAN, J. W.
405 S. Howard Ave., Tampa, Fla.
D.V.M., Terre Haute Veterinary College, 1913.
Voucher: V. L. Bruns.

HOPKINS, JOHN HENRY
Rt. 6, Middleburg Pike, Hagerstown, Md.
V.M.D., University of Pennsylvania, 1945.
Voucher: John D. Gadd.

IVIE, R. A.
Follett, Texas.
D.V.M., Texas A. & M. College, 1945.
Voucher: E. A. Grist.

KENNEDY, ARNOLD H.
Ontario Veterinary College, Guelph, Ont.
D.V.Sc., Ontario Veterinary College, 1933.
Voucher: G. A. Edge.

LATTIMER, BERNARD J.
Springfield, Minn.
D.V.M., Iowa State College, 1912.
Voucher: B. S. Pomeroy.

LEADBETTER, WAYNE A.
2350 South Dahlia, Denver, Colo.
D.V.M., Colorado A. & M. College, 1943.
Voucher: Earl D. Smith.

LUKAS, GUS N.
2443 K. Street, Eureka, Calif.
D.V.M., Iowa State College, 1950.
Voucher: Charles S. Travers.

KELM, GEO. W.
Hales Corners, Wis.
M.D.C., Chicago Veterinary College, 1899.
Voucher: B. A. Beach.

MALLETT, ROLAND C.
Box 322, Rt. 4, Dallas, Texas.
D.V.M., Texas A & M. College, 1944.
Voucher: E. A. Grist.

METZGER, ROBERT W.
Rt. 1, Constantia, N. Y.
D.V.M., New York State Veterinary College, 1932.
Voucher: Miss J. S. Halat.

MOSEY, ORRIN Q.
Reinbeck, Iowa.
D.V.M., Chicago Veterinary College, 1913.
Voucher: F. B. Young.

PERKINS, CHESTER A.
402 Third St., W. DePere, Wis.
D.V.M., Michigan State College, 1942.
Voucher: B. A. Beach.

PETER, ARNOLD E.
Mercedes, Texas.
D.V.M., McKillip Veterinary College, 1917.
Voucher: L. T. Hopkins.

PRIMISING, CHARLES J.
Melvin, Iowa.
D.V.M., Chicago Veterinary College, 1918.
Voucher: F. B. Young.

RAMSTEIN, RICHARD K.
Bourbon, Mo.
D.V.M., Texas A. & M. College, 1948.
Voucher: J. L. Wells.

RODE, W. F.
425 Exchange Bldg., So. St. Paul, Minn.
D.V.M., McKillip Veterinary College, 1913.
Voucher: B. S. Pomeroy.

SMIT, CHARLES R.
Wabasha, Minn.
D.V.M., Iowa State College, 1934.
Voucher: B. S. Pomeroy.

STEUBER, LAWRENCE J.
Prairie Du Sac, Sauk Co., Wis.

D.V.M., McKillip Veterinary College, 1914.
Voucher: B. A. Beach.

TUCKER, CARL CONRAD
618 35th St., N.E., Cedar Rapids, Iowa.
D.V.M., Ohio State University, 1935.
Voucher: F. B. Young.

WEINBERGER, ROBERT
4107 Herschel, Dallas, Texas.
D.V.M., Texas A. & M., 1944.
Voucher: E. A. Grist.

Second Listing

BARTON, ROBERT A., 1122 State Office Bldg., Richmond, Va.
BLUM, CLAYTON I., Box 504, Fredericksburg, Va.
BOWERS, BERLIN B., Timberville, Va.
BURLEY, D. R., 6417 Eastern Ave., Baltimore 24, Md.
DAY, JOSEPH E., 628 S. Main St., Viroqua, Wis.
DEAN, BEN H., 209 Carmel Ave., Piedmont, Calif.
DEHNER, LORIS A., Rt. 4, Box 94, Kent, Wash.
DONETH, HAROLD F., Mt. Pleasant, Mich.
EVANS, EDWARD B., Prairie View State College, Prairie View, Texas.
GIBBS, ROBERT E., 13313 Ardennes Ave., Rockville, Md.
GITZ, GEORGE H., SR., 1136 W. State St., Mason City, Iowa.
GRIM, GEORGE W., Wynnewood Plaza Apt., Wynnewood, Pa.
GRUBBS, CLARENCE B., Box 154, Sparta, Ga.
HAYES, RAYMOND W., 407 E. Arnold, Herington, Kan.
HERNANDEZ, ARTURO, Dardignac 95, Santiago, Chile.
HUGHES, TREVOR H., Rt. 3, Cooperstown, N.Y.
JACKSON, CARTER T., 1002 East Jackson Ave., Riverton, Wyo.
JONES, RUTH ELIZABETH, P. O. Box 5, Saratoga Springs, N.Y.
JUDIESCH, JOHN F., Melfort, Sask.
KERR, E. J., Minneota, Minn.
KILE, JAMES C., JR., Rt. 3, Clinton, Tenn.
KLOFANDA, MILTON C., 2554 W. Fond du Lac Ave., Milwaukee 6, Wis.
LINDSEY, LIONEL W., 154 Orchard Park Road, West Seneca 24, N.Y.
MABEL, DANIEL, Box 144, UxBridge, Mass.
MILLIGAN, JOHN G., Marion Junction, Ala.
MOORE, JOHN J., Marion Junction, Ala.
MURPHY, C. D., Casilla 2-D, Angol, Chile.
NICHOLS, WILBERT C., U. S. Military Port of Manila, APO No. 928, c/o Postmaster, San Francisco, Calif.
NUNNERY, MURRY E., 403 Kennesaw Ave., Marietta, Ga.
O'NEIL, JAMES M., 5th St., Calumet, Mich.
O'ROURKE, WILLIAM J., 112 North Water St., Columbus, Wis.
OWEN, HAROLD M., 7737 Gratiot Ave., Detroit 13, Mich.
OYARZUN, RAUL, Eyzaguirre 97, San Bernardo, Chile.
PITTMAN, A. B., 4629 Dodge St., Omaha 3, Neb.
SENIOR, GEORGE B., 1019 High Street, Des Moines, Iowa.
SERVICE, DON C., Rt. 7, Ellwood City, Pa.
SILVERSTEIN, EMANUEL, 1404 Ogden Ave., New York 52, N.Y.
SLAGLE, FRED O., 904 Fulton St., Falls City, Neb.
SPRATLIN, EDWARD W., Glasgow, Mont.
WEBER, RALPH E., Bancroft, Iowa.
WILLIAMS, D. J. E., Neosho Falls, Kan.

1951 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Iowa State College

DAUGHERTY, CHARLES J., D.V.M.
543 Forest Glen, Ames, Iowa.
Vouchers: Theodore F. Bartley and M. J. Johnson.

KELLEY, DALE E., D.V.M.
Box 217, Early, Iowa.
Vouchers: E. A. Benbrook and Dwight A. Smith.

SEARL, RICHARD C., D.V.M.
Farragut, Iowa.
Vouchers: Dwight A. Smith and F. K. Ramsey.

Michigan State College*

BRODIE, BRUCE O., D.V.M.
Maple Plain, Minn.
Vouchers: B. S. Pomeroy and Fred Gehrman.

Texas A. & M. College

PARKHILL, KENNETH R., D.V.M.
Box 742, Livingston, Texas.
Vouchers: Jack P. Fuller and A. A. Lenert.

Second Listing

Alabama Polytechnic Institute*

BRADSHAW, GEORGE S., D.V.M., Box 33, Dublin, Ga.

Colorado A. & M. College

DAVIDSON, J. EDWARD, D.V.M., 204 West Tenth St., Schuyler, Neb.
DENNIS, DANIEL S., D.V.M., Rt. 2, Myton, Utah.
GREENE, EARL L., JR., D.V.M., Box 89, Kingman, Kan.
HARDMAN, KENNETH W., D.V.M., Derby, Colo.
SIMONS, JOHN C., D.V.M., Box 110, Torrington, Wyo.

University of Georgia

ROBISON, ROBERT W., D.V.M., Box 535, Mooresville, N. Car.

Iowa State College

ANDERSON, WILLIAM LEE, D.V.M., Box 3, Blockton, Iowa.
BREGMAN, CHARLES H., D.V.M., Box 224, Cascade, Iowa.
BRINKMEYER, DALE L., D.V.M., New London, Iowa.
BUCHANAN, DON A., D.V.M., 3033 Ansborough, Waterloo, Iowa.
COOK, WALTER W., D.V.M., Bagley, Iowa.
CULLEN, A. RAYMOND, D.V.M., 1420 Fourth St., Boone, Iowa.
FENNESSY, WILLIAM, D.V.M., Dyersville, Iowa.
HOLST, RICHARD B., D.V.M., Williams, Iowa.
JACOBSEN, CARL E., D.V.M., 2721 West Street, Ames, Iowa.
JANSS, JOHN, JR., D.V.M., 1005 Eighth Ave., Belle Plaine, Iowa.
KIRKEGAARD, LEO JAMES, D.V.M., Box 576, Ralston, Neb.
KONTZ, MILO J., D.V.M., 828 Cedar Ave., Luverne, Minn.
MONTAG, MAURICE J., D.V.M., Woodbine, Iowa.
PEGLOW, ROBERT J., D.V.M., 302 School St., Iowa Falls, Iowa.
QUINLAN, MICHAEL F., D.V.M., 1229 Pennsylvania Ave., Des Moines, Iowa.
RAUN, ALAN R., D.V.M., 2305 North Court Drive, Ottumwa, Iowa.
ROGERS, JOHN J., D.V.M., 208 Mill St., East Troy, Wis.
STRAYER, PAUL MAX, D.V.M., Box 241, Elma, Iowa.
WUNDER, ROBERT D., D.V.M., Box 221, Avoca, Iowa.
YOUNG, FRANK W., D.V.M., Waukee, Iowa.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. Bureau of Animal Industry are reported as of Aug. 10, 1951.

NEW APPOINTMENTS

George E. Anderson, Knoxville, Tenn.
Chester P. Branigan, Memphis, Tenn.
Clinton E. Burkholder, Indianapolis, Ind.
Eugene A. Couture, Providence, R. I.
Walter B. Crowl, Los Angeles, Calif.
William H. Dunn, Buffalo, N. Y.
Mads C. F. Fisker, St. Paul, Minn.
Harry L. Gibson, Dayton, Ohio.
Richard H. Hull, Madison, Wis.
Donald W. Johnson, Mexico City, Mex.
Roman Kurylas, Baltimore, Md.
Bronislaw Mendlowski, Madison, Wis.
Merlin A. Nelson, Mexico City, Mex.
Dionnisuis Nestuik, Chicago, Ill.
Richard Olney, Little Rock, Ark.
Arthur H. Peck, Baltimore, Md.
James R. Prine, Fort Worth, Texas.
Mrs. Janina Soltowski, St. Paul, Minn.
Russell L. Toops, Mexico City, Mex.
John N. VanZandt, Richmond, Va.
Adolf Weinacker, Mexico City, Mex.

CANCELLATION

Donald E. Ellwanger, Mexico City, Mex.

RESIGNATIONS

Jean N. Archer, Des Moines, Iowa.
Percival G. Barber, Providence, R. I.
William R. Brown, San Francisco, Calif.
Leonard O. Goodloe, Kansas City, Kan.
Phil H. Graves, Boise, Idaho.
Joe W. Green, Indianapolis, Ind.
John W. Harding, Mexico City, Mex.
Harry E. McMillan, Boise, Idaho.
John W. Montgomery, Mexico City, Mex.
Harold A. Servais, Columbia, S. Car.
Moses A. Simmons, Mexico City, Mex.
Clyde T. Swisher, Boise, Idaho.
Seymour L. Weil, Columbus, Ohio.
Wellington W. Wiseman, Albuquerque, N. M.

MILITARY FURLOUGH

Erby L. Massie, Baltimore, Md.

SEPARATION

Russell L. Cowen, Scottsbluff, Neb.

RETIREMENTS

Joseph H. Bowers, Pittsburgh, Pa.
Chester P. Branigan, Memphis, Tenn.
Clinton E. Burkholder, Indianapolis, Ind.
Joseph C. Christiansen, Jacksonville, Fla.
Henry T. Juen, El Paso, Texas.
Ellis W. Kern, San Antonio, Texas.
Erle W. Nye, Fort Worth, Texas.

TRANSFERS

Wm. B. Guldeschuh, from New York City to Kingston, N. Y.
Clare C. Hamilton, from Kansas City, Kan., to St. Louis, Mo.
Henry M. Hans, from Los Angeles, Calif., to Portland, Ore.
Robert P. Jones, from Mexico City, Mex., to Sioux City, Iowa.
Lloyd J. Michael, from Phoenix, Ariz., to Helena, Mont.
Albert F. Ranney, from Montpelier, Vt., to Bismarck, N. Dak.
Floyd S. Ratts, from Topeka, Kan., to West Plains, Mo.
Fred M. Shigley, from Bismarck, N. Dak., to Olympia, Wash.

AMONG THE STATES AND PROVINCES

Florida

Animal Diseases Spotlighted in "Health Notes."—The Florida State Board of Health devoted an entire issue of its *Health Notes* (July, 1949) to the discussion of animal diseases which are transmissible to man. It tells the reader how such diseases as rabies, creeping eruption, brucellosis, mastitis, tuberculosis, equine encephalitis, trichinosis, and others are acquired, and points out how the individual can help in the control of them.

Georgia

South Georgia Association.—The summer meeting of the South Georgia Veterinary Association was held at Radium Springs Hotel in Albany, Ga., on Aug. 12, 1951. The chairman, Dr. G. C. Toliver, introduced the guests, among whom were several newly located veterinarians, and two from out of the state. Dr.

H. G. Young, chairman of the Radio Frequency Committee, reported that AVMA Executive Secretary John G. Hardenbergh said that the problem of overlapping frequencies of veterinarians with short-wave radios was too new yet for anything to be done about it. The problem is presently being studied by the F.C.C.

The program consisted of a round-table discussion led by Program Chairman **Dr. W. D. Martin, Jr.**, who discussed ear trimming with the assistance of **Drs. C. C. Sapp, F. E. Ducey, C. C. Rife,** and **A. U. Turner. Dr. C. H. Poitevint** discussed the advantages of conducting a large animal hospital in his practice. **Dr. J. B. Crane** spoke on treatments for poisoning. **Dr. John Salter** gave many practical pointers on everyday practice problems. **Dr. B. E. Carlisle** spoke on salt poisoning of swine and colic of mules. **Dr. Stapleton** discussed urinary calculi. Dr. Rife brought up several matters of interest that have come before the state association officials. About 50 veterinarians, wives, and guests enjoyed a delicious smorgasbord dinner at the Radium Springs Hotel.

s/WM. L. SIPPEL, *Secretary.*

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Radiological Health Training Program.—The Federal Security Agency, Public Health Service, Atlanta, Ga., announces that a radiological Health training program will be held Oct. 15-26, 1951; Feb. 4-15, 1952; and May 5-16, 1952. For further information, write Chief, Radiological Health Training Section, Environmental Health Center, Public Health Service, Federal Security Agency, 1014 Broadway, Cincinnati 2, Ohio.

Michigan

State Association Officers.—Officers who will serve the Michigan State Veterinary Medical Association for the ensuing year are Drs. E. K. Sales, East Lansing, president; W. O. Brinker, East Lansing, first vice-president; Louis Newlin, Romeo, second vice-president; F. M. Lamoreaux, Grand Rapids, third vice-president; Glen W. Reed, Lansing, secretary-treasurer; P. V. Howard, Grand Rapids, director, District 1; A. H. DeGroot, Dundee, director, District 2; L. H. LaFond, Detroit, director, District 3; C. H. Hays, Lansing, director, District 4; M. J. Geiger, Croswell, director, District 5; and A. R. Wingerter, Big Rapids, director, District 6.

s/GLEN W. REED, *Secretary.*

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Dr. Clark Named Dean of Veterinary College.—Dr. Chester F. Clark (MSC '29) has been named to succeed the late Dr. Claude S. Bryan as dean of the School of Veterinary Medicine at Michigan State College. Dean Bryan died July 30, 1951, from aplastic anemia (September JOURNAL, p. 223).

Dr. Clark has worked with Michigan veterinarians and farmers as a member of the Michigan State College veterinary staff and as a state veterinarian for more than twenty years. He first joined the staff of the College in 1929 as a technician in animal pathology. From 1946 to 1949, he left full-time duties with the faculty to serve as state veterinarian, during which time he was retained as a lecturer in surgery. Dr. Clark has been head of the Department of Surgery and Medicine since he returned to the staff in 1949.

New Jersey

New Association.—A regional veterinary medical association was formed on March 25, 1951, for veterinarians in the metropolitan New Jersey area. The organization was officially incorporated with the state as the Metropolitan New Jersey Veterinary Medical Association. Charter membership consists of approximately 50 members. At the first regular election of officers at the June meeting, the following men were elected: Drs. John J. Devine, South Orange, president; W. Philip Boyer, Morris Plains, vice-president; Myron S. Arlein, Maplewood, secretary-treasurer. Meetings are held the third Wednesday night of each month from October through June. The current meeting place is the Hotel Essex House in Newark.

s/MYRON S. ARLEIN, *Secretary.*

New York

Veterinary Student at Cornell Receives Military Award.—At the annual inspection of cadets at Cornell University on May 17, 1951, Mr.

Albert R. Greenwood

Albert R. Greenwood was awarded the Sons of American Revolution Medal for outstanding leadership, soldierly bearing, and excellence in classroom work in the veterinary R.O.T.C.

course. Mr. Greenwood is a senior student in the New York State Veterinary College at Cornell University and is concurrently in the second year of the advanced veterinary R.O.T.C.

S/WM. E. JENNINGS, *Colonel, V.C.*

Pennsylvania

Veterinary Faculty.—The following promotions in the faculty of the School of Veterinary Medicine, University of Pennsylvania, were approved as of July 1, 1951: Drs. Mark W. Allam, professor of veterinary surgery; David K. Detweiler, associate professor of pharmacology; Donald G. Lee, professor of veterinary anatomy; R. J. Maloney, associate professor of veterinary surgery; John E. Martin, assistant professor of physiology and pharmacology; John T. McGrath, assistant professor of veterinary pathology.

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Omega Tau Sigma To Meet.—On Oct. 19-20, 1951, the Grand Council of the Omega Tau Sigma fraternity will hold its twenty-fourth annual meeting at the home of the Alpha Chapter, School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

S/JOHN E. MARTIN, *Publicity Chairman.*

FOREIGN NEWS

Liberia

Dr. Pegg To Serve as Research Adviser.—Dr. Charles E. Pegg, representing the U. S. Department of Agriculture, will serve as a research adviser to the government of Liberia, particularly in the field of veterinary medicine, as a part of the Point Four program of technical assistance. Dr. Pegg's headquarters will be in Monrovia, where he will become a member of the U. S. Government's economic mission for the development of Liberian agriculture.

VETERINARY MILITARY SERVICE

New Location for the Office of the Surgeon General of the Air Force.—The office of the Surgeon General of the Air Force has been moved from the Pentagon to Temporary Building No. 8 at 3800 Newark St., Northwest. Mail and telegraph address remains the same as before: Headquarters, USAF, Washington 25, D.C.

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Air Force Officers Honored.—Major Charles H. Snider (KSC '40), East St. Louis, Mo., and Capt. U. S. Grant Kuhn III (WSC '44), Seattle, Wash., Air Force veterinary officers, were recently elected to Delta Omega, the honorary health organization of the American Public Health Association. Membership is based on scholastic attainment and contribution to the health of the nation.

BIRTHS

Dr. (KSC '43) and Mrs. Ralph L. Messer, Kansas City, Kan., announce the birth of a daughter, Robin, on July 1, 1951.

Dr. (ONT '38) and Mrs. Kenneth Bone, Chicago, Ill., announce the birth of a daughter, Jean Ruth, on July 17, 1951.

Dr. (KSC '46) and Mrs. Wm. J. Winchester and Billy (age 17 mo.), Rosemead, Calif., announce the arrival of Peggy Jean on July 18, 1951.

Dr. (KSC '47) and Mrs. Jacob Lawrence, Glen Oaks, Long Island, N. Y., announce the birth of a daughter, Victoria Beth, on July 28, 1951.

Dr. (OVC '50) and Mrs. R. J. Taggart, Canora, Sask., announce the arrival of a daughter, Margaret Jean, on Aug. 6, 1951.

DEATHS

★**Second Lieutenant Richard G. Ashcraft** (OSU '49), 24, Camp Atterbury, Ind., died July 23, 1951, of acute tracheobronchitis and complications. Lt. Ashcraft was admitted to the AVMA in 1949.

C. B. Crawford (KCV '12), 77, Horton, Kan., died July 5, 1951. Dr. Crawford was a general practitioner. He was a member of the Kansas State Veterinary Medical Association and had been a member of the AVMA.

C. H. Koon (CVC '07), Maquoketa, Iowa, was killed in an automobile accident June 28, 1951.

★**E. E. Nisbett** (MCK '18), 60, Nashville, Tenn., died May 31, 1951. Dr. Nisbett was a general practitioner. He was admitted to the AVMA in 1934.

Walter P. O'Hara (ONT '08), Manotick, Ont., died early in 1950. Dr. O'Hara was a general practitioner.

★**E. E. Patterson** (GR '01), 85, Detroit, Mich., died May 5, 1951. Dr. Patterson was a member of the Michigan State and Southeastern Michigan Veterinary Medical Associations and was admitted to the AVMA in 1915.

★**John Boyd Thompson** (CVC '10), 68, Walker, Minn., died Sept. 13, 1950, of pneumonia and heart trouble. Dr. Thompson had retired some time before his death. He was a member of the AVMA.

Myron W. Tedrow (CVC '11), New Salem, Ill., died in June, 1951. Dr. Tedrow was a general practitioner.

★**William B. Tipton** (STJ '13), 78, Emporia, Kan., died recently (date unknown). Dr. Tipton had practiced in Emporia for nearly forty years and had retired a year ago. He was admitted to the AVMA in 1913.

★Indicates members of the AVMA.

Official Roster, 1951-1952
American Veterinary Medical Association

Officers

John R. Wells, *President*, Box 2424, West Palm Beach, Fla.

W. L. Boyd, *President-Elect*, University Farm, St. Paul 1, Minn.

E. A. Grist, *1st Vice-President*, New Braunfels, Texas.

C. C. Rife, *2nd Vice-President*, 420 Edgewood Ave., N.E., Atlanta, Ga.

I. S. McAdory, *3rd Vice-President*, Box 410, Alabama Polytechnic Institute, Auburn, Ala.

A. D. Glover, *4th Vice-President*, 806 Lewis St., Canton, Mo.

L. C. Swan, *5th Vice-President*, 20 Court St., St. Catharines, Ont.

J. G. Hardenbergh, *Executive Secretary*, 600 S. Michigan Ave., Chicago 5, Ill.

C. D. Van Houweling, *Assistant Executive Secretary*, 600 S. Michigan Ave., Chicago 5, Ill.

W. A. Young, *Treasurer*, 157 W. Grand Ave., Chicago 10, Ill.

Executive Board

W. G. Brock, *Chairman*, 110 Exposition Ave., Dallas 1, Texas (1956).

A. L. McNabb, *1st District*, Ontario Veterinary College, Guelph, Ont. (1952).

S. F. Scheidy, *2nd District*, 943 Turner Ave., Drexel Hill, Pa. (1953).

O. Norling-Christensen, *3rd District*, 730 Hibbard Rd., Wilmette, Ill. (1953).

R. S. Sugg, *4th District*, 408 Magnolia Ave., Auburn, Ala. (1954).

C. F. Schlotthauer, *5th District*, 508 15th Ave., S.W., Rochester, Minn. (1955).

J. M. Arburua, *6th District*, 26 Fell St., San Francisco, Calif. (1956).

E. E. Wegner, *7th District*, 700 California St., Pullman, Wash. (1955).

W. G. Brock, *8th District, ibid.*

Edwin Laitinen, *9th District*, 993 N. Main St., West Hartford, Conn. (1952).

W. R. Krill, *10th District*, Ohio State University, Columbus 10, Ohio (1954).

John R. Wells, *ex officio*, Box 2424, West Palm Beach, Fla.

W. L. Boyd, *ex officio*, University Farm, St. Paul 1, Minn.

W. M. Coffee, *ex officio*, La Center, Ky. (1952).

Board of Governors*
(Ex Officio)

W. G. Brock, *Chairman;* John R. Wells, W. L. Boyd.

*The Board of Governors is also, *ex officio*, the committee on Journal for the Association's publications.

Editorial Staff

L. A. Merillat, *Editor Emeritus.*

C. R. Donham, *Editor ad Interim.*

J. G. Hardenbergh, *Managing Editor.*

Helen S. Bayless, *Assistant Editor* and *Advertising Manager.*

Central Office Staff

Executive Secretary and Managing Editor—J. G. Hardenbergh, V.M.D.

Assistant Executive Secretary and Director of Professional Relations—C. D. Van Houweling, D.V.M.

Editorial Staff—Helen S. Bayless, Assistant Editor and Advertising Manager; Eva G. Bailey and Elaine T. Bell, Editorial Assistants.

Public Relations Department and Office Supervisor—J. J. Shaffer.

Secretarial Staff—Rosalyn Zirlin, Financial Secretary and Secretary to Dr. Hardenbergh; Jane Hebert, Secretary to Dr. Van Houweling.

Directory Department—Mary B. Sanem.

Subscription Department—Walter Glazer.

Receptionist-Clerk—Patricia D. Wade.

Circulation Department—Jean Foreman and William Jackson.

Associate Editors

J. A. Campbell, *Diseases of Captive Wild Animals.*—45 Spadina Rd. Toronto, Ont.

M. G. Fincher, *Large Animal Medicine.*—New York State Veterinary College, Cornell University, Ithaca, N. Y.

D. L. Lichty, *Public Health.*—Box 29, West Palm Beach, Fla.

A. A. Lenert, *Surgery and Obstetrics.*—College Station, Texas.

L. J. Goss, *Diseases of Wildlife and Furbearing Animals.*—New York Zoölogical Park, 185th St. and Southern Blvd., New York 60, N. Y.

G. W. Jensen, *Cattle Practice.*—Antioch, Ill.

E. Jungherr, *Poultry Diseases.*—Storrs Agricultural Experiment Station, Storrs, Conn.

Brig. Gen. J. A. McCallam, *Military Veterinary Medicine (Army).*—Office of the Surgeon General, Department of Army, Main Navy Bldg., Washington 25, D. C.; *(Air Force).*—Col. W. O. Kester, Veterinary Division, Office of the Surgeon General, Hq. U.S.A.F., Washington 25, D. C.

L. T. Railsback, *Swine Practice.*—Ellsworth, Minn.

R. E. Rebrassier, *Parasitology.*—Veterinary Clinic, Ohio State University, Columbus 10, Ohio.

C. N. Bramer, *Small Animal Medicine.*—1021 Davis St., Evanston, Ill.

Section Officers*

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(Ex Officio)

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J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill.
W. A. Young, 157 W. Grand Ave., Chicago 10, Ill.

Council on Education

*W. A. Aitken, *Chairman*, Merrill, Iowa (Representing General Practice) (1952).
*†W. A. Hagan, *Secretary*, New York State Veterinary College, Cornell University, Ithaca, N. Y. (Representing Basic Sciences) (1954).
I. B. Boughton, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (Representing Research and Education) (1952).
Garth A. Edge, Provincial Department of Public Health, Toronto, Ont. (Representing Public Health) (1957).
*James Farquharson, Division of Veterinary Medicine, Colorado A. & M. College, Ft. Collins, Colo. (Representing Clinical Sciences) (1956).
S. W. Haigler, 7645 Delmar Blvd., St. Louis 5, Mo. (Representing Small Animal Practice) (1954).
C. C. Hastings, Williamsville, Ill. (Representing Large Animal Practice) (1953).
Lt. Col. William E. Jennings, 1019 Hanshaw Rd., Ithaca, N. Y. (Representing Military Service) (1956).
M. S. Shahan, Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture, Washington 25, D. C. (Representing Government Service) (1955).

*These three members comprise the Executive Committee of the Council and are elected by the Executive Board; the remaining members are appointed by the president.

†Resigned, September, 1951. Successor will be elected by Executive Board.

Legislation

J. G. Hardenbergh, *Chairman, ex officio*, 600 S. Michigan Ave., Chicago 5, Ill.
C. C. Franks, 2330 Amherst St., Des Moines 13, Iowa (1953).
Geo. W. Gillie, 628 Oakdale Dr., Ft. Wayne, Ind. (1955).
E. A. Davis, 1006 13th St., Columbus, Ga. (1956).
B. T. Simms, Bureau of Animal Industry, U. S. Department of Agriculture, Washington 25, D. C. (1954).

Resolutions

A. A. Husman, *Chairman*, 320 Agricultural Bldg., Raleigh, N. Car.
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Allan S. Barnes, P. O. Box 231, Frankfort, Ky.
V. L. Bruns, Box 623, Williston, Fla.
John H. Gillmann, Box 2321, DeSoto Station, Memphis, Tenn.
S. E. Hershey, Box 283, Charleston, W. Va.

Biological Products

John W. Safford, *Chairman*, Livestock Sanitary Board, Helena, Mont. (1954).
William L. Gates, Box 417, Clarksdale, Miss. (1955).
O. E. Herl, 1401 Oglethorpe St., N.W., Washington 11, D. C. (1952).

E. L. Mundell, 2032 S. 14th St., Kansas City 2, Kan. (1956).
L. R. Vawter, Department of Veterinary Science, University of Nevada, Reno, Nev. (1953).

Therapeutic Agents

Roger P. Link, *Chairman,* Department of Veterinary Physiology and Pharmacology, University of Illinois, Urbana, Ill. (1956).
D. K. Detweiler, 48 Sproul Rd., Broomall, Pa. (1953).
L. A. Gendreau, 67 Wellington St. S., Sherbrooke, Que. (1952).
R. C. Glover, 1021 Davis St., Evanston, Ill. (1954).
L. Meyer Jones, Division of Veterinary Medicine, Iowa State College, Ames, Iowa (1955).

Public Relations

A. H. Quin, *Chairman,* 239 E. 72nd Terrace, Kansas City 5, Mo. (1954).
E. C. Chamberlayne, 36 Aubrey St., Winnipeg, Man. (1956).
W. M. Coffee, La Center, Ky. (1953).
Louis A. Corwin, 136-21 Hillside Ave., Richmond Hill 18, N. Y. (1952).
A. G. Madden, Jr., Madeira, Ohio (1955).

Poultry

C. D. Lee, *Chairman,* Poultry Department, Iowa State College, Ames, Iowa (1955).
J. O. Alberts, College of Veterinary Medicine, University of Illinois, Urbana, Ill. (1954).
C. W. Barber, Gainesville Poultry Laboratory, S. Main St., Gainesville, Ga. (1956).
Ellis E. Jones, 714 S. Santa Anita St., San Gabriel, Calif. (1953).
A. B. Wickware, Division of Animal Pathology, Central Experimental Farm, Ottawa, Ont. (1952).

Parasitology

W. S. Bailey, *Chairman,* School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala. (1956).
D. W. Baker, New York State Veterinary College, Cornell University, Ithaca, N. Y. (1953).
E. A. Benbrook, Department of Veterinary Pathology, Iowa State College, Ames, Iowa (1954).
Charles G. Durbin, 5705 Berwyn Road, Berwyn Heights, Md. (1955).
R. D. Turk, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (1952).

Nutrition

M. J. Swenson, *Chairman,* School of Veterinary Medicine, Kansas State College, Manhattan, Kan. (1953).
J. Gordon Anderson, 1016 9th Ave. W., Calgary, Alberta (1954).
T. J. Jones, School of Veterinary Medicine, University of Georgia, Athens, Ga. (1955).
Jesse Sampson, College of Veterinary Medicine, University of Illinois, Urbana, Ill. (1952).
C. K. Whitehair, Animal Husbandry Department, Oklahoma A. & M. College, Stillwater, Okla. (1956).

Registry of Veterinary Pathology
Army Institute of Pathology

A. W. Moulux, *Chairman,* Armed Forces Institute of Pathology, 7th and Independence Ave., S.W., Washington 25, D. C. (1954).
Major Chester A. Gleiser, Armed Forces Institute of Pathology, 7th St. and Independence Ave., Washington, D. C. (1952).
Hugh G. Grady, Scientific Director, American Registry of Pathology, Army Medical Museum, Washington 25, D. C. (Consulting member).
Hilton A. Smith, Veterinary Laboratory, Texas A. & M. College, College Station, Texas (1953).

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*This committee is charged with the selection of recipients of the Twelfth International Veterinary Congress Prize, the Borden Award, and the AVMA Award.

History

H. P. Hoskins, *Chairman,* 2766 Garrison St., Evanston, Ill. (1955).
Joseph M. Arburua, 26 Fell St., San Francisco, Calif. (1953).
R. R. Dykstra, School of Veterinary Medicine, Kansas State College, Manhattan, Kan. (1954).
Charles Murray, Division of Veterinary Medicine, Iowa State College, Ames, Iowa (1956).
A. E. Wight, 3730 18th St., N. E., Washington 18, D. C. (1952).

Committee on Ethics

S. W. Haigler, *Chairman,* 7645 Delmar Blvd., St. Louis 5, Mo. (1952).
L. A. Mosher, P. O. Box 1533, Atlanta, Ga. (1954).
J. A. Winkler, Alexandria Pike, Cold Spring, Ky. (1953).

Research Council
(Appointments are for three-year terms)

Anatomy and Histology.—L. E. St. Clair, *Secretary,* College of Veterinary Medicine, University of Illinois, Urbana, Ill. (1952).

Bacteriology (Immunology and Biologic Therapy).—L. C. Ferguson, 2456 Lexington Ave., Columbus 3, Ohio (1953).

Biochemistry and Animal Nutrition.—T. J. Jones, School of Veterinary Medicine, University of Georgia, Athens, Ga. (1953).

Large Animal Medicine.—James Farquharson, Division of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo. (1953).

Large Animal Surgery.—A. G. Danks, New York State Veterinary College, Cornell University, Ithaca, N. Y. (1954).

Parasitology.—R. D. Turk, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (1954).

Pathology.—L. M. Roderick, School of Veterinary Medicine, Kansas State College, Manhattan, Kan. (1953).

Physiology and Pharmacology.—D. K. Detweiler, 48 Sproul Rd., Broomall, Pa. (1953).

Poultry Pathology.—C. A. Brandly, Department of Veterinary Science, University of Wisconsin, Madison, Wis. (1954).

Small Animal Medicine.—C. P. Zepp, Sr., 136 W. 53rd St., New York 19, N. Y. (1952).

Small Animal Surgery.—C. F. Schlotthauer, *Vice-Chairman,* Division of Experimental Medicine, The Mayo Foundation, Rochester, Minn. (1952).

Veterinary Hygiene.—Andrew L. MacNabb, Ontario Veterinary College, Guelph, Ont. (1952).

Virus Diseases.—C. H. Cunningham, Michigan State College, East Lansing, Mich. (1952).

X-Ray.—M. A. Emmerson, *Chairman,* Division of Veterinary Medicine, Iowa State College, Ames, Iowa (1954).

Member-at-Large.—D. A. Sanders, Agricultural Experiment Station, University of Florida, Gainesville, Fla. (1954).

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(Ten-year appointments terminating in 1959)

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F. J. Kingma, Veterinary Laboratory, College of Veterinary Medicine, The Ohio State University, Columbus, Ohio.
H. J. Milks, New York State Veterinary College, Cornell University, Ithaca, N. Y.

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C. W. Bower, 1128 Kansas Ave., Topeka, Kan. (AAHA) (1952).
J. B. Engle, 16 Fairfield Terrace, Short Hills, N. J. (AVMA) (1954).
Lloyd C. Moss, Veterinary Hospital, Colorado A. & M. College, Fort Collins, Colo. (1955).

Special Committees
(Terms are for one year unless reappointed)

Nomenclature of Diseases

Carl Olson, Jr., *Chairman,* Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln, Neb.
C. Lawrence Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass.
Henry J. Griffiths, School of Veterinary Medicine, University Farm, St. Paul, Minn.
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Peter Olafson, New York State Veterinary College, Cornell University, Ithaca, N. Y.
H. C. Stephenson, New York State Veterinary College, Cornell University, Ithaca, N. Y.
Frank Thorp, Jr., Department of Animal Pathology, School of Veterinary Medicine, Michigan State College, East Lansing, Mich.

Food and Milk Hygiene

H. E. Kingman, Jr., *Chairman*, c/o Wilson & Co., 4100 S. Ashland Ave., Chicago, Ill.
J. W. Cunkelman, Veterinary Division, Research Department, Swift & Co., Chicago, Ill.
Raymond J. Helvig, Milk and Food Section, Sanitary Engineering Division, U. S. Public Health Service, Washington 25, D. C.
C. H. Pals, Bureau of Animal Industry, U. S. Department of Agriculture, Washington 25, D.C.
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Harry E. Shepherd, 1515 37th St., Sacramento 16, Calif.
H. G. Stafseth, Department of Bacteriology, Michigan State College, East Lansing, Mich.

Diseases of Food-Producing Animals

A. P. Schneider, *Chairman*, 2417 Bannock St., Boise, Idaho.
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C. D. Grinnells, State College Station, Raleigh, N. Car.
E. A. Grist, Box 11, New Braunfels, Texas.
T. L. Steenerson, Wilkinson, Ind.

Diseases of Wild and Furbearing Animals

E. R. Quortrup, *Chairman*, Livestock Department, 4005 Rosecrans, Bldg. 2, San Diego 12, Calif.
T. T. Chaddock, Box 51, Bridgeport, Mich.
John R. Gorham, Department of Veterinary Science, University of Wisconsin, Madison, Wis.
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Patricia O'Connor, 97 Broad St., Stapleton, S.I., N. Y.

Scientific Exhibits

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E. A. Benbrook, Iowa State College, Ames, Iowa.
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Diseases of Small Animals

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I. D. Wilson, Virginia Polytechnic Institute, Blacksburg, Va.

Humane Act Award

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A. R. Theobald, 4545 Reading Road, Cincinnati 29, Ohio.
W. A. Young, 157 W. Grand Ave., Chicago 10, Ill.

Practitioner Participation in Brucellosis Control

P. G. MacKintosh, *Chairman*, Box 856, Yakima, Wash.
A. B. Christian, Biltmore Dairy Farms, Biltmore, N. Car.
Tom Evans, 2610 N. 4th St., Albuquerque, N. M.
J. L. McAuliff, 11 Jewett Ave., Cortland, N. Y.
H. W. Nance, Box 414, Lawrenceburg, Tenn.
A. M. Orum, Box 355, Carthage, Ill.

Rabies

E. S. Tierkel, *Chairman*, U. S. Public Health Service, Virus Laboratory, Rt. 3, Box 436, Montgomery 5, Ala.
C. W. Bower, 1128 Kansas Ave., Topeka, Kan.
J. Raymond Currey, 5313 Wisconsin Ave., N. W., Washington 15, D. C.
J. E. Scatterday, Box 210, Florida State Board of Health, Jacksonville 1, Fla.
Robert F. Willson, 338 Bates St., Detroit, Mich.

Advisory Committee on Diseases of Zoological Park Animals

L. J. Goss, *Chairman*, New York Zoölogical Park, 185th St. and Southern Blvd., New York 60, N. Y.
I. E. Altman, 107 Flatbush Ave., Brooklyn 17, N. Y.
F. L. Herchenroeder, Room 527, 45 Broadway, New York 6, N. Y.
C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y.
J. H. Steele, Veterinary Public Health Division, Communicable Disease Center, U.S.P.H.S., 605 Volunteer Bldg., Atlanta 3, Ga.

Animal Reproduction and Artificial Insemination

S. H. McNutt, *Chairman,* Veterinary Science Department, University of Wisconsin, Madison, Wis.

J. A. Henderson, Ontario Veterinary College, Guelph, Ont.

H. E. Kingman, Sr., Wyoming Hereford Ranch, Cheyenne, Wyo.

J. C. Ramge, 81 Sharon Spring Dr., Worthington, Ohio.

Greg R. Raps, 3108 Ellis St., Ames, Iowa.

D. C. Reid, Box 272, Clinton, N. J.

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C. W. Bower, 1128 Kansas Ave., Topeka, Kan.

W. G. Brock, 110 Exposition Ave., Dallas, Texas.

James Farquharson, Division of Veterinary Medicine, Colorado A. &. M. College, Fort Collins, Colo.

A. H. Quin, 239 East 72nd Terrace, Kansas City 5, Mo.

C. F. Schlotthauer, 508 15th Ave., S. W., Rochester, Minn.

Hospitals for Large and Small Animals

Stanley E. Ferguson, *Chairman,* Logan Ave., Lake Geneva, Wis.

A. E. Erickson, Rt. 1, Charlotte, Mich.

A. F. Hayes, Box 1703, Billings, Mont.

P. E. Madsen, 336 N. Jefferson St., Sheridan, Wyo.

C. P. Vickers, Box 1207, Tallahassee, Fla.

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Francis D. Egan, Grand-Ten Veterinary Hospital, 20891 Gill Rd., Farmington, Mich.

H. G. Geyer,* Division of Animal Industry, Ohio Department of Agriculture, Columbus 15, Ohio.

W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N.Y.

R. A. Kelser, School of Veterinary Medicine, University of Pennsylvania, Pa.

W. H. Riser,* 5335 Touhy Ave., Skokie, Ill.

James H. Steele, U.S.P.H.S., 605 Volunteer Bldg., Atlanta 3, Ga.

R. S. Sugg, Box 872, Auburn, Ala.

V. B. Vanderloo,* 1815 Asbury St., Dubuque, Iowa.

Asa Winter,* Bureau of Animal Industry, Department of Agriculture, Washington 25, D. C.

Ex Officio: W. G. Brock and/or other members of the Board of Governors.

*These men also constitute the Executive Committee of the National Emergency Advisory Committee.

Representatives
(Terms are for one year except as shown)

American Association for the Advancement of Science.—K. F. Meyer, Medical Centre, University of California, 3rd & Parnassus Aves., San Francisco 22, Calif.

American Medical Association Council on National Emergency Medical Service.—C. D. Van Houweling, 600 S. Michigan Ave., Chicago 5, Ill.

Army Medical Library, Honorary Consulting Board. —J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill.

Livestock Conservation, Inc.—W. E. Logan, Box 174, Harrisburg, Pa. (1953).

National Brucellosis Committee.—A. M. Orum, Box 355, Carthage, Ill.

National Research Council (Division of Biology and Agriculture).—E. P. Johnson, Box 593, Blacksburg, Va. (1954).

National Research Council (Division of Medical Sciences).—R. A. Kelser, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa. (1953).

National Sanitation Foundation.—C. D. Van Houweling, 600 S. Michigan Ave., Chicago 5, Ill.

National Society for Medical Research.—J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill.

Ralston Purina Research Fellowship Committee.—M. A. Emmerson, Division of Veterinary Medicine, Iowa State College, Ames, Iowa (1953).

United States Pharmacopoeial Convention.—H. E. Moskey, Food and Drug Administration, Federal Security Agency, Washington 25, D. C. (1960).

Program*
(Ex Officio)

This committee is composed of the chairmen and secretaries of the six sections with the executive secretary or assistant executive secretary acting as the chairman. (*See* Section Officers, page 328.)

*Pursuant to article XII, section 1, part 4, of the Administrative By-Laws, as amended at the seventy-eighth annual meeting.

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Alabama.—I. S. McAdory, Alabama Polytechnic Institute, Auburn.

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California.—E. E. Jones, 714 S. Santa Anita St., San Gabriel.

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Delaware.—Harry McDaniel, State Board of Agriculture, Dover.

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Idaho.—A. P. Schneider, 108 Capitol Bldg., Boise.

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Kansas.—Charles W. Bower, 1128 Kansas Ave., Topeka.

Kentucky.—L. M. Roach, Versailles Rd., Frankfort.

Louisiana.—R. B. Lank, Dalrymple Bldg., Louisiana State University, Baton Rouge.

Maine.—J. F. Witter, Department of Animal Industry, University of Maine, Orono.

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Massachusetts.—L. A. Paquin, Box 225, Webster.

Michigan.—Paul V. Howard, 4011 Hunsberger N.E., Grand Rapids.

Minnesota.—Henry J. Griffiths, School of Veterinary Medicine, University of Minnesota, St. Paul 1.

Mississippi.—W. L. Gates, Box 417, Clarksdale.

Missouri.—G. L. Dunlap, 800 Woodswether Road, Kansas City.

Montana.—A. M. Jasmin, Livestock Sanitary Board, Helena.

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Nevada.—Edward Records, University of Nevada, Reno.

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North Dakota.—Frederik Low, 337 Post Office Bldg., Bismarck.

Ohio.—Charles D. Diesem, 1858 Chatfield Rd., Columbus 12.

Oklahoma.—O. E. Robinson, Bixby.

Oregon.—Roy H. Peterson, 707 Manor Ave., Tillamook.

Pennsylvania.—Roy D. Hoffman, 525 S. Richard St., Bedford.

Rhode Island.—J. S. Barber, 560 Pleasant St., Pawtucket.

South Carolina.—F. P. Caughman, Jr., Box 5215, Columbia 5.

South Dakota.—R. M. Scott, 2419 S. Main Ave., Sioux Falls.

Tennessee.—Hugh Lamb, P.O. Box 550, Athens.

Texas.—L. G. Cloud, 2833 W. 7th St., Fort Worth.

Utah.—Hugh Hurst, 1754 E. 27th St. S., Salt Lake City.

Vermont.—W. D. Bolton, Pine Tree Terr., South Burlington.

Virginia.—W. L. Bendix, 1102 State Office Bldg., Richmond.

Washington.—J. L. Ellis, 2022 E. 4th Ave., Olympia.

West Virginia.—S. E. Hershey, Box 283, Charleston.

Wisconsin.—J. T. Schwab, 3218 Oxford Rd., Madison 5.

Wyoming.—O. E. Bunnell, Box 96, Worland.

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Canal Zone.—Paul H. Dowell, Box 2022, Christobal.

Hawaii.—Wilson M. Pang, 89 Ala Kimo, Honolulu 17.

Puerto Rico.—A. Lopez-Pacheco, Box 155, Hato-Rey.

Virgin Islands.—R. Von Decken-Luers, Estate Anna's Hope, Christiansted, St. Croix.

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British Columbia.—James G. Jervis R. R. 7, Langley Prairie.

Manitoba.—R. H. Lay, 613 Dominion Public Bldg., Winnipeg.

New Brunswick.—Adam T. McLean, Box 402, Moncton.

Nova Scotia.—R. McG. Archibald, 400 Prince St., Truro.

Ontario.—T. Lloyd Jones, Department of Pathology, Ontario Veterinary College, Guelph.

Prince Edward Island.—Geo. C. Bishop, Provincial Agricultural Laboratory, Charlottetown.

Quebec.—Paul Genest, Laboratoire de Recherches Veterinaires, St. Hyacinthe.

Saskatchewan.—R. A. Waechter, Provincial Veterinarian, Legislative Bldg., Regina.

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Bermuda.—J. W. Sutherland, Fairylands, Pembroke West.

Brazil.—A. V. Machado, Rau Paracatu 1.178, Belo Horizonte, Minas.

British West Africa.—Desmond H. Hill, University College, Ibadan, Nigeria.

Chile.—Julio San Miguel, Casilla 7025, Santiago.

Columbia.—R. H. Almanza, Carrera 17, No. 23-73, Bogata.

Cuba.—R. Lagarde, Calle 23, No. 802, Vedado, Havana.

Denmark.—Erik Blom, State Veterinary Serum Laboratory, Copenhagen.

Ecuador.—C. G. Sotomayor, Guayaquil.

Egypt.—J. E. B. Aghion, 20 Sharia Senan, Pasha St., Zeitoun.

Eire.—P. A. Rogan, Department of Agriculture, Dublin.

England.—H. W. Steele-Bodger, 28 Litchfield St., Tamworth, Staffordshire.

Formosa (Free China).—S. S. Young, No. 9 of 40 Lane, Tsao Chow St., Taipeh, Taiwan (Formosa).

France.—Pierre Goret, 153 Avenue de Neuilly, Neuilly-Sur-Seine.

Iceland.—Prof. N. Dungal, University of Reykjavik, Reykjavik.

Israel.—Simon Bornstein, Box 112, Ramat Gan.

Mexico.—Luis Santa Maria, Apartado Postal No. 2067, Mexico, D. F.

Netherlands.—Jacob Jansen, Institute for Parasitic and Infectious Diseases, Utrecht.

New Zealand.—I. J. Cunningham, Animal Research Station, Wallaceville.

Peru.—Jose Santivanez Morales, Veterinary College, San Marcos University, Lima.

Philippine Islands.—Jose B. Aranez, University of the Philippines, Tanauan Batangas.

Scotland.—Robert D. MacKintosh, Cairnhill, Huntley, Aberdeenshire.

St. Kitts.—A. W. Vaughan, Veterinary Department, St. Kitts-Nevis, B.W.I.

Siam.—Charas Suebsaeng, Department of Animal Development, Ministry of Agriculture, Bangkok.

Spain.—Juan Talavera, Calle Iturbe 14, Madrid.

Sweden.—Fritz M. Nilsson, Tradgardsgatan 3, Halsingborg.

Switzerland.—W. Frei, Zurich.

Trinidad.—A. Victor Hall, Stock Farm, St. Joseph.

Union of South Africa.—G. Martinaglia, Dower Lodge, The Avenue, Orchards, Johannesburg.

Uruguay.—Guillermo P. Lockhart, Rondeau 1441, Montevideo.

Venezuela.—Caludio E. Muskus, P.O. Box 993, Caracas.

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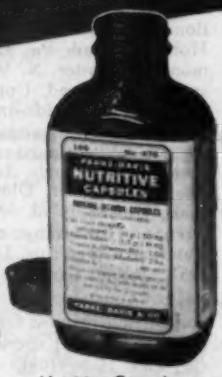

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Southwestern Iowa Veterinary Medical Association. Fall meeting. Council Bluffs, Iowa, Oct. 2, 1951. F. B. Young, Box 6, Waukee, Iowa.

Purdue University. Annual short course for veterinarians. Purdue University, La Fayette, Ind., Oct. 3-5, 1951. L. M. Hutchings, Department of Veterinary Science, Purdue University, La Fayette, Ind., chairman.

South Dakota Veterinary Medical Association. Annual meeting. Cataract Hotel, Sioux Falls, S. Dak., Oct. 4-5, 1951. Robert M. Scott, 1501 Main Ave., Sioux Falls, S. Dak., secretary.

West Virginia Veterinary Medical Association. Annual meeting. Huntington, W. Va., Oct. 7-8, 1951. James Bailey, Bluefield, W. Va., secretary.

Missouri, University of. Short course for veterinarians. School of Veterinary Medicine, University of Missouri, Oct. 8-9, 1951. Cecil Elder, chairman.

Military Surgeons of the United States. Annual convention. Palmer House, Chicago, Ill., Oct. 8-10, 1951. Col. James M. Phalen, Armed Forces Institute of Pathology, Washington, D. C., secretary.

Pennsylvania State Veterinary Medical Association. Annual meeting. Bedford Springs Hotel, Bedford, Pa., Oct. 10-12, 1951. Raymond C. Snyder, N. W. Cor. Walnut Street and Copley Road, Upper Darby, Pa., secretary.

Eastern Iowa Veterinary Association, Inc. Thirty-eighth annual meeting. Hotel Montrose, Cedar Rapids, Iowa, Oct. 11-12, 1951. N. R. Waggoner, Olin, Iowa, secretary.

Illinois, University of. Annual veterinary conference. University of Illinois College of Veterinary Medicine, Urbana, Ill., Oct. 11-12, 1951. Robert Graham, dean.

Georgia Coastal Plain Experiment Station. Annual short course for veterinarians. Georgia Coastal Plain Experiment Station, Tifton, Ga., Oct. 15-16, 1951. Wm. L. Sippel, secretary.

New England Veterinary Medical Association. Annual meeting. Equinox House, Manchester, Vt., Oct. 19-20, 1951. David A. Walker, Morrisville, Vt., president.

Southern Veterinary Medical Association. Annual meeting. Lord Baltimore Hotel, Baltimore, Md., Oct. 22-24, 1951. A. A. Husman, 320 Agric. Bldg., Raleigh, N. Car., secretary.

Minnesota, University of. Short Course for veterinarians. School of Veterinary Medicine, University of Minnesota, Oct. 25-26, 1951. B. S. Pomeroy, secretary.

Florida State Veterinary Medical Association. Annual meeting. Hotel Floridan, Tampa, Fla., Oct. 28-30, 1951. V. L. Bruns, Box 623, Williston, Fla., secretary.

American Public Health Association. Annual meeting. Civic Auditorium, San Francisco, Calif., Oct. 29-Nov. 2, 1951. J. C. Geiger, director of public health of the city and county of San Francisco, in charge of local arrangements.

Mississippi Valley Veterinary Medical Association. Annual fall meeting. Pere Marquette Hotel, Peoria, Ill., Oct. 31-Nov. 1, 1951. R. J. Kirkpatrick, 1235 N. Henderson St., Galesburg, Ill., secretary.

Cornell Nutrition Conference for Feed Manufacturers. Statler Hotel, Buffalo, N.Y., Nov. 1-2, 1951. J. T. Reid, Department of Animal Husbandry, Cornell University, Ithaca, N.Y., chairman.

Interstate Veterinary Medical Association. Annual meeting. Martin Hotel, Sioux City, Iowa, Nov. 1-2, 1951. E. G. Cole, 510 W. 19th St., Sioux City, Iowa, secretary.

United States Livestock Sanitary Association. Fifty-fifth annual meeting. Hotel President, Kansas City, Mo., Nov. 14-16, 1951. R. A. Hendershott, 1 West State St., Trenton, N. J., secretary.

Animal Care Panel. Annual national meeting. Thorne Hall, Chicago Campus of Northwestern University, Chicago, Ill., Nov. 29-30, 1951. Bennett J. Cohen, the Medical School, Ward Memorial Building, 303 E. Chicago Ave., Chicago, Ill., secretary.

American Association for the Advancement of Science. Annual meeting. Convention Hall, adjacent to the University of Pennsylvania School of Medicine, Philadelphia, Pa., Dec. 26-31, 1951. R. L. Taylor, 1515 Massachusetts Ave., N.W., Washington 5, D.C., assistant administrative secretary.

Oklahoma Veterinary Medical Association. Annual winter meeting. Mayo Hotel, Tulsa, Okla., Jan. 7-8, 1952. Lewis H. Moe, 1736 W. Third Ave., Stillwater, Okla., secretary.

New York State Veterinary College. Conference for veterinarians. Cornell University, Ithaca, N. Y., Jan. 9-11, 1952. W. A. Hagan, dean.

Iowa Veterinary Medical Association. Annual meeting. Fort Des Moines Hotel, Des Moines,

(Continued on p. 30)

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Iowa, Jan. 16-18, 1952. F. B. Young, Waukee, Iowa, secretary.

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. Howard F. Carroll, 2024 Lombard St., San Francisco 23, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month (except July and August) at Black's Tea Room, Waterloo. F. E. Brutsman, Traer, Iowa, secretary.

Central California Veterinary Medical Association, fourth Tuesday of each month. Thomas Eville, Rt. 1, Box 136H, Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. J. T. Dixon, Winston-Salem, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. O. A. Soave, 5666 Telegraph, Oakland, Calif., secretary.

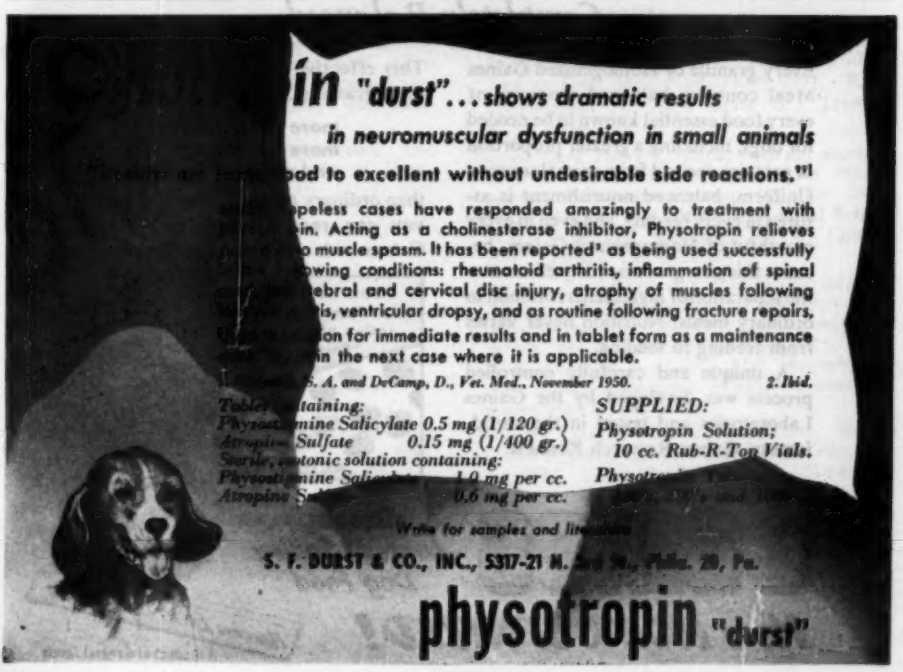
Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

(*Continued on p. 32*)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S. A. and DeCamp, D., Vet. Med., November 1950. 2. Ibid.
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(COMING MEETINGS—*continued from p. 30*)

Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. T. M. Eagle, Parkville, Route 2, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. K. M. Curts, 70 Central Ave., Kansas City 18, Kan., secretary.

Keystone Veterinary Medical Association, the Penn-Sheraton Hotel, 39th and Chestnut St., Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., corresponding secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday night of each month from October through June, at the Hotel Essex House, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month. Write R. W. Worley, secretary, 3224 L.W.W., South Bend, Ind., for location.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. C. Edward Taylor, 2146 South Broad St., San Luis Obispo, Calif., secretary.

New Castle County Veterinary Society, the second Wednesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Harold Roberts, Paper Mill Road, Newark R3, Del., secretary.

New York City Veterinary Medical Association. Hotel Statler, New York, N. Y., the first

(*Continued on p. 34*)

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(COMING MEETINGS—*continued from p. 32*)

Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. V. E. Graff, Oakdale, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. James R. Ketchersid, 666 East Highland Avenue, San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, bimonthly, the second Tuesday of each month. J. H. Bower, P. O. Box 355, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. E. W. Paul, Box 866, Redwood City, Calif., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month, in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. L. G. Nicholson, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. John E. Wion, 3614 Redwood Highway South, Santa Rosa, Calif.

Roanoke-Tar (N. Car.) Veterinary Medical Association, the first Friday of each month, 7:00 p.m., in Rocky Mount. G. L. Gilchrist, Edenton, N. Car., secretary.

Sacramento Valley Veterinary Medical Association, the fourth Friday of each month. R. C. Goulding, 11511 Capitol Avenue, Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. R. J. McFarland, 3621 Jewell St., San Diego 9, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. R. W. Sprowl, 11756 San Vicente Blvd., Los Angeles 49, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, 8:00 p.m., at the Peckway Skeet Club, Robert P. Knowles, 2936 N.W. 17th Ave., Miami, Fla., secretary.

(*Continued on p. 36*)

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(COMING MEETINGS—*continued from p. 34*)

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla. John Carnes, Muskogee, Okla., secretary.

Foreign Meetings

First Pan American Veterinary Conference. Lima, Peru, Oct. 20-26, 1951. José Santivañez Morales, president, Organizing Committee, and dean, Veterinary College, San Marcos University, Lima, Peru.

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Nitrogen-free Extract, not less than	40.00%

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July 1951
August 1951

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Cockroaches as Disease Spreaders.—Controlled experiments with cockroaches infected by feeding on contaminated material demonstrated that over a period of seven days they excreted enough virus of mouse encephalitis to kill test mice. Poliomyelitis virus and other microörganisms also were transmitted to mice by cockroaches.—*Abstr. in What's New (Abbott), April, 1951.*

Friskies

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No. 10

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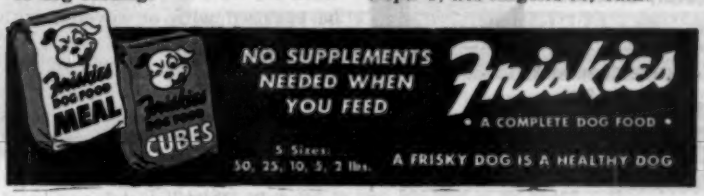
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The Etymology of the Word "Veterinarian"

Webster's New International Dictionary (Unabridged) states that "veterinary" originates from the Latin, *veterinarius*, meaning of, or belonging to, beasts of burden. Other references state that the word means old beasts of burden and that the origin of the word is obscure. A little research into etymology will remove the obscurity.

If we first study the word veteran, we find that it means adult, mature, or experienced. It does not mean old age but life with years of experience.

Vita — life, vital, vitality, youth.
Vito — to escape life.
Veta — evolution of life, evolved to maturity.
Veto — to stop, to end.
Veter — years of life, maturity of life.

The second syllable, *"er,"* is from the Greek *eros* meaning years (Webster, Skeat). We use the same stem in the English word, "era," meaning a period of years.

The third syllable "an," is from *anthro*, meaning a man.

If we next compare the words "veterinary" and "itinerary" we find that they have something in common. Itinerary means "to travel" and all travelling on land, in early days, was done with oxen, horses, or camels. The first syllable in itinerary, "it," is from the Latin, *iter*, meaning journey; example, *iter unius diei* (one day's journey). An animal fit for travel had to be old enough and trained to yoke, harness, bridle, or saddle. Hence, the young animals were unfit for the purpose. The second and third syllables in both words, "veterinary" and "itinerary," mean the same thing—animals covered with hair, fur, or wool. *Erion* is the Greek word for wool or fur. *Eri* or *erin* means to be enclosed with or covered with wool or hair.

In proof of this statement, the following terms are offered.

Eriometer—an instrument used in laboratories to measure cilia, flagella, hair, bacteria, filaments, fibers, and minute particles.
Erinacei—pertaining to furbearing animals; example: *Dyphillobothrium erinacei*, a tape worm in carnivores.

(*Continued on p. 42*)

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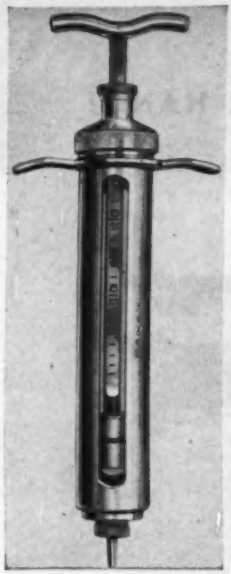

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(*Continued from p. 40*)

Eristalis—talis means tail: eristalis, a tail covered with hair.
Ermine—weasel.
Ermin—to cover with fur.
Erizo—the ability to erect spines as in the porcupine, feathers in birds, or hair in dogs and cats by involuntary action of erector pili muscles.
Eriophillous—having leaves with wooly or downy surface.
Nemertina—ciliated helminths as compared to menathelimiths, the latter having a tough cuticle without cilia.

Our present system of zoölogic classification or taxonomy originated with Linnaeus in 1750. A much older system is credited to Aristotle. He made the simple observation that naked man belonged to a different group than the hairy, woolly, or feathered animals. He described the fur- or wool-bearing family as *erinaceae*. Travel, transportation, and war depended on animals, not calves or colts, but mature or veteran or trained animals. The men who cared for these animals were called veterinarians. A strict interpretation of the word does not imply surgical or medical therapy, although the ancients did treat their animals along with other duties. Our modern veterinarian is a "veterinatrist" from the Greek word *iatrikos* (therapy).

A psychologist studies psychology, but a psychiatrist treats mental conditions.

A cynologist is a dog expert or judge or fancier.

A cyniatrist is a veterinarian who specializes in treating the diseases of dogs.

An hippologist is an equine expert; an hippiatrist is an equine veterinarian.

A boviatrist is a cattle doctor.

An ailouriatrist is a cat doctor.

An aviatrist is a bird doctor.

A galliniatrist is a poultry doctor.

A zoiatrist is a veterinarian who treats all animals, both domestic and wild.

VetERINAry—ERINAceae.—*F. D. Egan, D.V.M., Farmington, Mich.*

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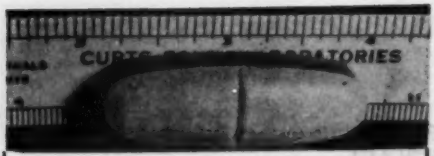

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(*Continued on p. 46*)

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(*Continued on p. 48*)

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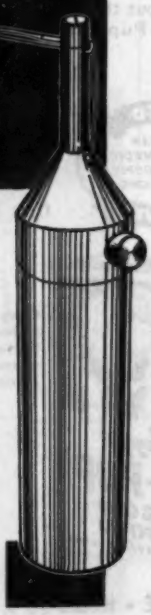

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(*Continued on p. 50*)

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1. Muhrer, M. E. (1950), Restraint of Swine with Pentothal Sodium, J. A. V. M. A., 117:293, Oct.

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(CLASSIFIED ADS—*continued from p. 48*)

office building. Reason for selling—purchased small animal hospital in larger city. Price, value of real estate. Address Dr. T. W. Hallett, Washington St., Orleans, Ind.

FOR SALE—large animal practice, long established, British Columbia coast, gross at least $12,000. Price $5,000 including some instruments and equipment. No competition. Modern home, with large office for rent or sale optional. Address "Box M 21," c/o JOURNAL of the AVMA.

For Sale—Miscellaneous

FOR SALE—Bosch and Lomb monocular microscope. Used only while in school. 10 X eye piece. 16-, 4-, and 1.8-mm. objectives. $125.00. Address Dr. E. J. Pope, 206 Tallwood St., Norfolk, Va.

Books and Magazines

DOGS—anything in books, kennel blanks, contracts, pedigree forms, etc. Can ship C.O.D. Keep up on dogs with *Dog World* magazine. Subscription $3.00 a year. Judy Publishing Co., 3323 Michigan Blvd., Chicago 16, Ill.

For Sale—Artificial Insemination Supplies

ARTIFICIAL INSEMINATION INSTRUMENTS —Essential equipment, replacement parts and materials, designed and manufactured especially for artificial insemination. Prompt delivery. New catalog. Address: Breeder's Equipment Co., Flourtown, Pa.

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VETERINARY DIAGNOSTIC LABORATORIES

These laboratories have been established to aid veterinarians in the diagnosis of obscure as well as common ailments in large and small animals. An expert and experienced veterinary pathologist heads our staff to give quick and accurate diagnosis at all times.

Our service includes fecal examinations, urinalysis, blood counts, culture work, tissue sections, skin scrapings, and autopsies, and is designed to assist owners and breeders of stock of all kinds including dogs, horses, cattle, poultry, hogs and sheep.

Descriptive pamphlet, sample containers and fees on request.

Dr. Seymour Nord, Pathologist
Dr. James R. Kinney, Consultant

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Lieutenant Frederick Henry of Clinton, Oklahoma—Medal of Honor for sacrificing himself to save his platoon in combat near Am-Dong, Korea, September 1, 1950. When the platoon could no longer hold its position, Lieutenant Henry ordered the men to pull back. But someone had to stay behind to provide covering fire. He chose to be that man, and was lost.

Always remember this—Lieutenant Henry offered his life for more than just a small platoon in far-away Korea. It was also for America. For you.

Isn't there something you can do when this man did so much? Yes, there is. You can help keep the land he loved solid and strong and secure. You can do a job for defense . . . by buying United States Defense* Bonds, *now!* For your bonds give your country greater strength. And a strong America is your best hope for peace and freedom—just as it was his.

Defense is your job, too. For the sake of *every* man in service, and for *yours*, start buying more United States Defense Bonds now.

Remember when you're buying bonds for defense, you're also building personal cash savings. Remember, too, if you don't save *regularly*, you generally don't save at all. So sign up in the Payroll Savings Plan where you work, or the Bond-A-Month Plan where you bank. For your country's security, and your own, buy United States Defense Bonds!

U.S. Savings Bonds are Defense Bonds - Buy them regularly!

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FOR FARM ANIMALS

Iocine Tablets are now available for convenient administration and dispensing.

Like Iocine Granules, they supply a new approach to the treatment of *impotency* in breeding sires. Field reports indicate that *bulls, boars,* and *rams* profit from proper administration of Iocine.

In dairy cows, milk production can be increased by adding Iocine to the daily ration. When Iocine is fed to *swine,* it results in better utilization of feed with more uniform weight gains; and when included in the *poultry* ration, it serves to step up egg production.

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ALSO CONFERS PASSIVE IMMUNITY TO

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Newer knowledge of the widespread prevalence of infectious canine hepatitis (Rubarth's disease) and its highly contagious characteristics suggested an urgent need for a protective agent.

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These controlled experiments adequately prove the value of Anti-Canine Distemper Serum (Lockhart) when administered at the rate of 0.5 cc per pound body weight. In addition to its superiority as a prophylactic and therapeutic agent against canine distemper (virus of Carré) it protects dogs which may be exposed to infectious hepatitis.

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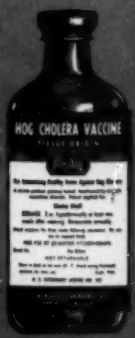

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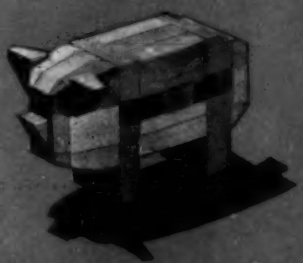
When you use Jen-Sal Hog Cholera Vaccine, you use a sterile product . . . with no risk of fatal over-reactions. One 5-cc. dose confers a year's protection on healthy shotes and adult swine. Order your supply from our nearest depot or agent. Jensen-Salsbery Laboratories, Inc., Box 167, Kansas City 10, Missouri.